

A CHILTON

PUBLICATION

# The Iron Age

THE NATIONAL METALWORKING WEEKLY

MICHIGAN

JUN 19 1953

June 18, 1953

CONTENTS PAGE 2

## EAST ENGINEERING

LIBRARY

This wonder weapon can detect an approaching enemy aircraft 15 miles (90 seconds) away and blast it out of the sky far short of its objective. The Skysweeper automatically gauges the speed and course of the oncoming target and fires high velocity, proximity-fused shells to intercept and bring down the plane.

New Departure ball bearings help give the Skysweeper its uncanny ability to detect and destroy. These bearings are marvels of accuracy themselves. In many instances tolerances are held within a few millionths of an inch, and all component parts must pass countless searching inspections . . . by far the highest manufacturing standards in the industry.

# SKYSWEEPER

- ACCURATE TO THE **ND** DEGREE

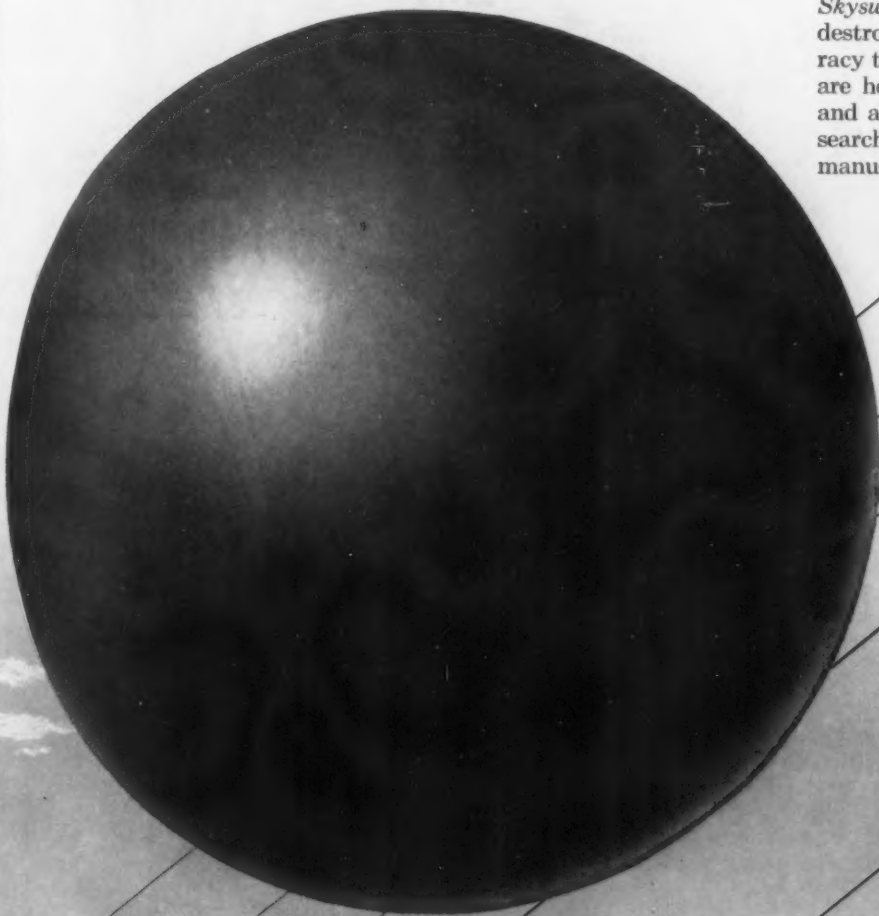
NOTHING ROLLS LIKE A BALL



## NEW DEPARTURE

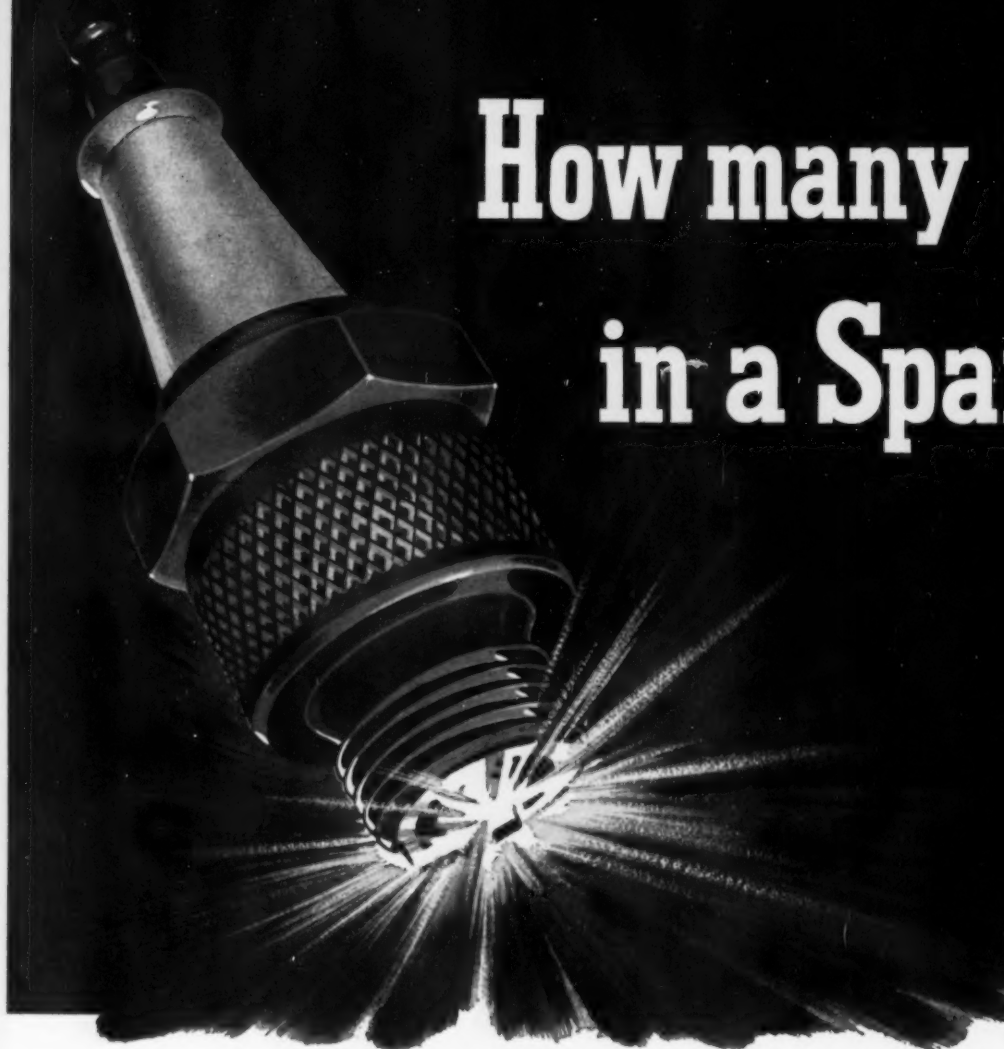
### BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT  
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# How many SPARKS in a Spark Plug

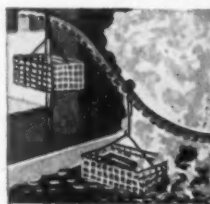


Surprising, the confidence that people have in spark plugs. No one stops to question how many "sparks" they're good for, because long-life performance has come to be taken for granted. Yet, when you get right down to it, you'll find good reasons for this complete consumer confidence. And, from a "sparking" point of view, perhaps the most important is the almost universal use of special Hoskins alloys for the vital electrode wires.

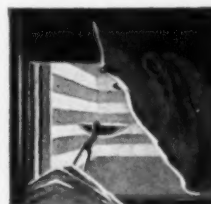
Producing the wire that sparks your car to power is a tough and tricky business. It requires special care in the selection of raw materials. Special melting and production techniques. Plus extremely close control over alloy composition and uniformity of quality throughout the entire manufacturing process.

Yet that's exactly the kind of alloy that Hoskins is qualified to produce best. For, among the other quality-controlled alloys developed and manufac-

tured by Hoskins are: Alloy 717—for facing engine valves; Alloy 785—for brazing belts; Alloy 502—for countless heat resistant mechanical applications. Then, too, there are the Chromel-Alumel thermocouple alloys . . . guaranteed to register true temperature-EMF values within specified close limits. And, of course, Hoskins CHROMEL . . . the *original* nickel-chromium resistance alloy used as heating elements and cold resistors in countless different products.



Hot stuff for hot jobs! Hoskins Alloy 502 is ideally suited to many mechanical-structural applications.



Heating elements made of Hoskins Chromel deliver full-rated power throughout their long and useful life.



Chromel-Alumel thermocouple alloys accurately measure exhaust temperatures of jet aircraft engines.



## HOSKINS

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\* Starred items are digested at the right.

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## NEWS DEVELOPMENTS

### STEEL WAGE HIKE WILL BRING PRICE RISE — P. 91

New steel labor wage agreements will bring an increase in steel base prices of around \$4 a ton. Metalworkers will be pressured for corresponding wage increases in their own plants. New contract firmly establishes McDonald as a strong USW bargainer. Washington kept hands off wage talks.

### STEEL AIMS AT COOPERATION WITH CAPITOL — P. 93

Goal of better industry-government relationships may be achieved if Justice Dept. okays new plan. Would set up steel industry committee in Washington patterned after National Petroleum Council. Plan is outlined. Aluminum, chemical industries have similar proposals. They await Justice Dept. comment.

### FEAR FOURTH QUARTER TITANIUM SHORTAGE — P. 94

Industry and government officials are becoming concerned about the possibility of a fourth quarter titanium shortage. Fear there may not be enough to meet critical Air Force needs. Spongemaking capacity is a bottleneck. NPA has suggested special directives to speed shipments to military users.

### PUBLIC ENTHUSIASTIC ON POWER STEERING — P. 97

Hardly a speck on the horizon 2 years ago, power steering now threatens automatic transmissions for No. 1 accessory spot. More than 10 pct of new cars are equipped—and this may well double by end of '54. Interest in automotive use of plastics also runs high at SAE summer meeting.

### FORM NEW AGENCY TO FOSTER COMMERCE—P. 99

Business Services Administration designed to help streamline Commerce Dept. and head it back to its original aims of fostering, promoting and developing industry, business and commerce. Will take over NPA, absorb three other agencies. Head man will be top industry executive.

### EXECUTIVES ACQUIRE ELEPHANT MEMORIES — P. 99

How would you like to be able to scan 75 pages of The Iron Age and then be able to remember generally but accurately what was on each page? Last Monday 38 metalworking executives proved they could do that and more—they were graduating from Dr. Bruno Furst's School of Memory.



# f the Week in Metalworking

## ENGINEERING & PRODUCTION

### STAINLESS ALLOY FILLS INDUSTRY NEED — P. 149

High corrosion resistance, hardenability and machinability in the quench-annealed condition are virtues of the new V2B stainless alloy. Corrosion and erosion resistance, plus the metal's nongalling characteristics, have suggested use for valve disks, pump impellers, and other wear parts.

### SHELL MOLDING: IN YOUR PARTS PICTURE?—P. 154

Interest in shell molding runs high among foundrymen and metalworking executives. Based on experience with a new shell molding machine, the process, for cost and finish, falls midway between regular sand casting and investment casting. An unusual pressure backup system eliminates shot backup.

### AIR CONTROL: COSTS DOWN, MORALE UP—P. 159

One hundred pct air conditioning is paying its way in one of the largest metalworking plants in which it has been tried. In this big, windowless plant there is complete control of temperature, humidity and air cleanliness. Manufacture of precision parts is easier; employee morale is high.

### EXPERIENCE BIG AID TO SMALL BUSINESS — P. 164

Small business has much to gain from the broad experience of the professional consulting management engineer. He makes an impartial and objective study of business and production operations. On his recommendations, management is able to make sound policy decisions.

### NEXT WEEK—SINTERED STEEL BUSHINGS IN CHAIN

Roller chain with sintered steel bushings is suitable for use where standard roller chain is not or cannot be lubricated properly. If used for the recommended horsepower, and where shock loads are not too great, it outlasts standard chain. Lubrication at the chain joints helps resist corrosion.

### NEXT WEEK—PRECISION ROLLING SPEEDS JET SEALS

Accurately made rolls and ingenious coiling equipment have speeded roll forming of precision parts. With special tooling on a standard machine, nickel seals for jet engines are formed at a linear rate of 70 fpm. Diameter of seals is held to within 0.0005 in., other dimensions to within 0.001 in.

## MARKETS & PRICES

### FREIGHT CAR BACKLOGS STILL ON LONG SLIDE—P. 95

Freight car backlogs have coasted down for 26 consecutive months, falling from a high of 113,713 to 33,770. No immediate easing is expected as railroads indicate car supply is adequate. Fourth quarter is regarded as critical month for car builders. Shutdowns may start then if new orders aren't in.

### ALUMINUM COURTS OIL AND GAS MARKETS — P. 102

With a quarter of its capacity in the immediate Gulf Coast area, aluminum is actively seeking local outlets. Oil and gas industry is a natural. Good corrosion resistance and light weight result in economies which frequently offset higher metal costs. Much development work is being done.

### HIGH AUTO OUTPUT WORRIES BANKERS ASSN.—P. 108

American Bankers Assn. last week warned automakers that they couldn't sell all the cars they were making at present price levels. Used car dealers, already complaining about tight credit, were singled out as in a specially dangerous position. Bankers were told to tighten used car credit further.

### METALWORKING EXPANSION GOALS UPPED—P. 118

Office of Defense Mobilization has revised earlier estimates and raised expansion goals for metalworking equipment industries \$20 million. Machine tool production capacity will be upped \$7 million. New goals are based on industry needs. Most urgent expansion need reported to be for broaching tools.

### INVENTORIES OF STEEL LOOK BIGGER — P. 191

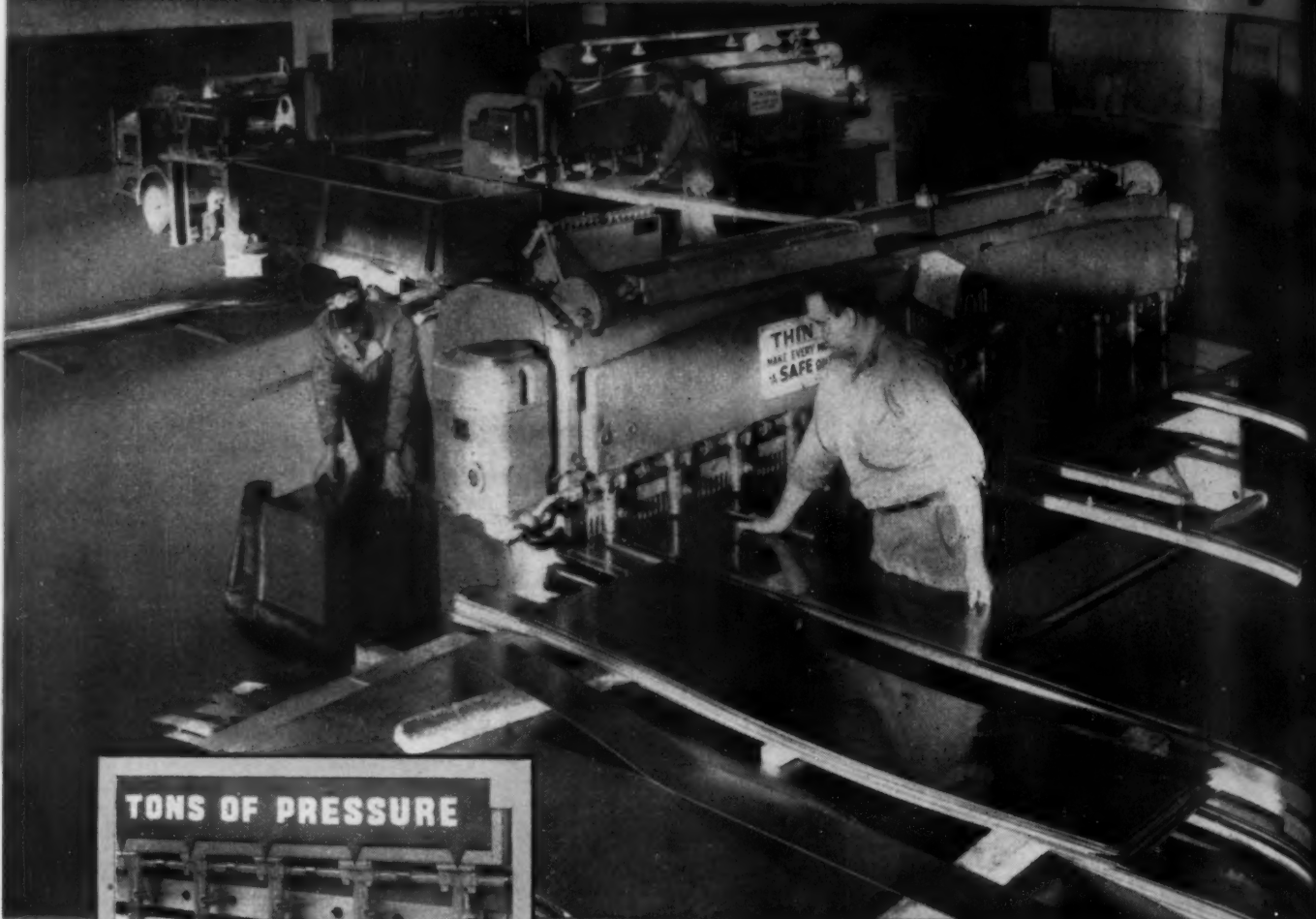
Manufacturers' steel inventories look bigger now that a wage agreement has been reached without a strike. Automakers are shifting some steel from lagging truck production to auto assembly lines. Fourth quarter conversion is lagging, but third quarter is firm. Demand is past its highest point.

### COPPER REFINERS SET NEW OUTPUT RECORD—P. 194

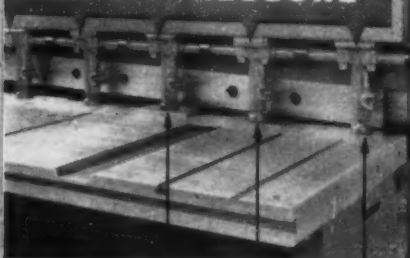
Statistics show U. S. refiners produced 117,929 tons of copper in May for an alltime high. And fabricators were shipped 146,815 tons of the red metal—the highest total in over 6 years. But the Chilean government has done nothing about cutting its 35.5¢ per lb price on copper.



# ACCURACY is necessary



## TONS OF PRESSURE



3/8" 10 Gauge Zero

Micrometer accuracy starts with Cincinnati Hydraulic Holddowns. They exert tons of pressure and automatically hold all thicknesses of work securely.

## ...AND THE SPEED AND VERSATILITY OF CINCINNATI SHEARS IS NEEDED, TOO

Here at The W. J. Holliday Company, Inc., The Department Store of Steel—these busy Cincinnati Shears operating continuously, shear accurate blanks to customer size.

They handle cold finished, or pickled and oiled sheets up to 10 gauge and hot rolled sheets up to 1/4". Both management and operators are enthusiastic about their Cincinnati Shears.

Write for Shear Catalog S-6.

*Photos courtesy The W. J. Holliday Company, Inc., Indianapolis, Indiana*

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## Editorial

The Iron Age

FOUNDED 1855

## Steel Wages and Prices

THE steel wage accord was reached through collective bargain-  
 ing—a method not used for some time. The government was not  
 a factor in the negotiations—a new experience for the union.

The agreement has been hailed as presaging a new era of labor-  
 management peace. That may well be. But it will take more than  
 public statements to bring this about.

Realistic appraisal by both sides of each other's advantages, plus  
 a little give-and-take brought a happy and sudden end to the negotia-  
 tions. Steel was prepared to go no farther than 5¢ an hour but did  
 not want a strike. The union wanted no less than 10¢ an hour with-  
 out a strike.

Both compromised. The reasons why they did may contribute to  
 prolonged labor peace in the steel industry. Maybe a new feeling is  
 coming. If so, it will be a joint effort which may break with the old-  
 time rough and tumble. Bombast and window dressing may be on  
 their way out.

David McDonald was on trial as new president of the steel union.  
 He is a comparatively young man with none of the old union-manage-  
 ment fighting scars of years ago. His brain trust—which he consults  
 —are down to earth people not addicted to wishful thinking.

Men representing the larger steel firms have a secret respect for  
 the steel union. They have taken Mr. McDonald's measure and find  
 him no pushover. They, too, are sick of annual wranglings, strikes  
 and public washing of dirty linen.

But the union and steel have tremendous responsibilities. They  
 can slug it out but at the expense of others who get hurt too. Steel  
 is the bellwether in the metal field—as far as labor and prices are con-  
 cerned. What happens in steel happens to steel users and to their  
 customers.

Steel labor is near the top in wages. It can be paid these wages  
 only from steel prices or productivity advances or both. Millions of  
 consumers—including labor which earns less than steel labor—pay  
 the final price which supports steel wages and prices.

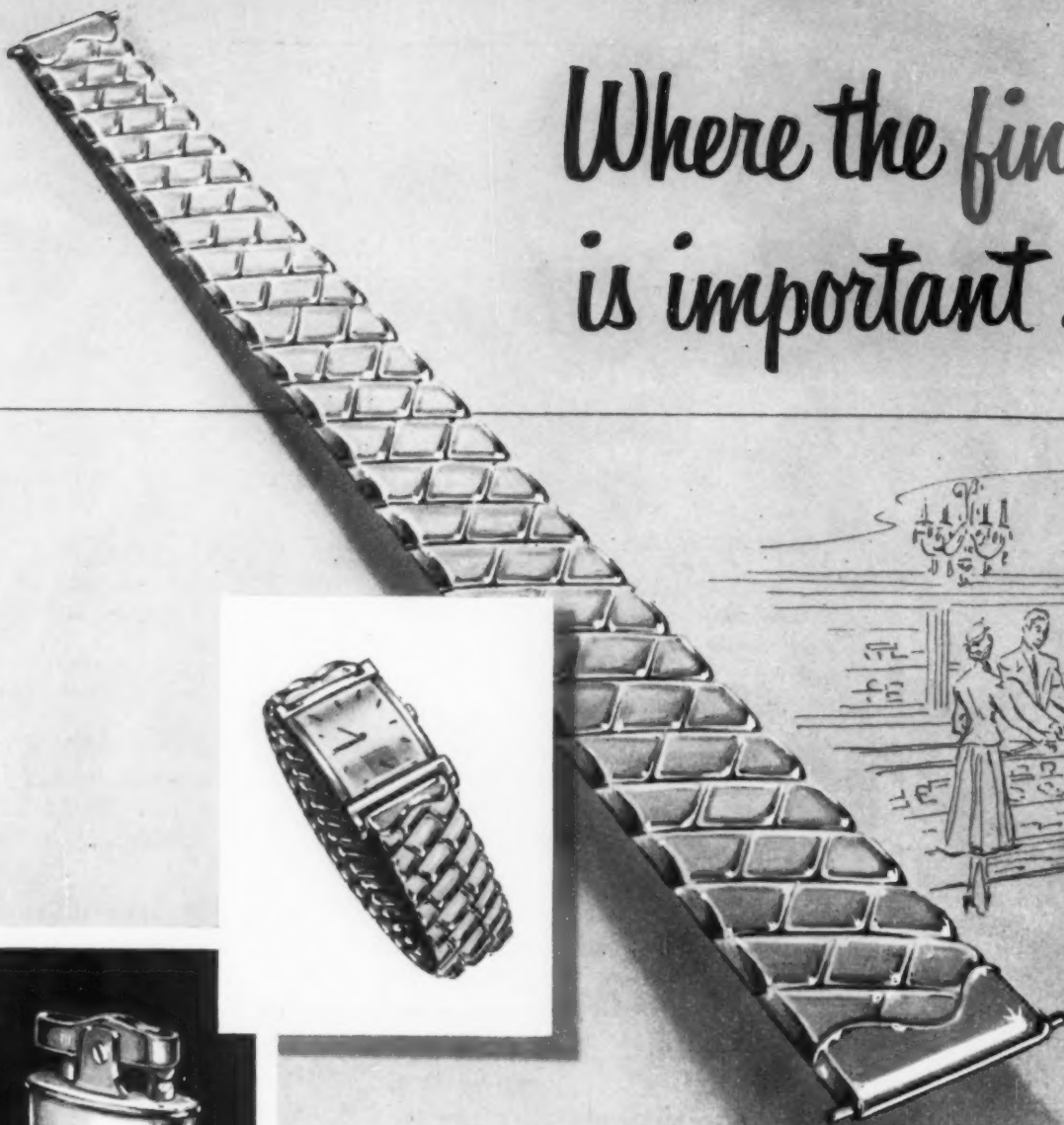
Steel management has and will meet labor half way. Labor has  
 made a start toward statesmanship. If neither falters, a basic indus-  
 try with labor's help can point the way to a sane and enduring rela-  
 tionship—the effects of which will go far beyond steel.

Tom Campbell

Editor



Where the finish  
is important ...



Specify ...

# S H A R O N TAINLESS STEELS

Manufacturers of products purchased essentially by women know the value of eye appeal. Jewelry ... pots and pans ... utensils in particular, must have appearance as well as be serviceable.

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Get the 430 Story — Sharon has prepared a fact-packed, fully illustrated booklet with up-to-the-minute information about 430 Stainless Steel. To get your free copy contact your nearest Sharon representative or write direct. There are Sharon offices in Chicago, Cincinnati, Cleveland, Dayton, Detroit, Indianapolis, Milwaukee, New York, Philadelphia, Rochester, Los Angeles, San Francisco, Montreal and Toronto.

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SHARONSTEEL



# Dear Editor:

Letters from readers

## More Parts

Sir:

In your June 4 issue, p. 83, there appears a news item about a newly designed powder metal parts press which has stepped up production by 400 pct.

I would like to know the name of the company that has designed this press.

E. P. ENGSTRAND  
Chief Metallurgist

American Sintered Alloys Div.  
The Yale & Towne Mfg. Co.  
Bethel, Conn.

The new press was designed and built by the F. J. Stokes Machine Co., Tabor Road, Philadelphia, Pa.—Ed.

## Clarification

Sir:

It is shocking to read in the box at the bottom of p. 140 of the May 14 issue the statement, "how martensite transforms through bainite, troostite and sorbite to pearlite," because there is an implication that someone believes such a sequence does occur . . .

The terms troostite and sorbite have been excluded from good metallurgical literature for more than 15 years . . . and it is established beyond quibble that bainite and pearlite form only as transformation products of austenite.

Furthermore, extensive work on the tempering of martensite in recent years by Prof. Morris Cohen and his associates at MIT, and others, shows clearly that only ferrite and carbides—either epsilon carbide, cementite or alloy carbide—are the products which form when martensite is heated.

P. PAYSON  
Asst. Director of Research  
Crucible Steel Co. of America  
Harrison, N. J.

H. C. Boynton, Sc.D., one of the authors, replies: your criticism may be warranted from a strictly "ultra-modern-atomic-age" metallurgist, but unfortunately not all the old-fashioned "hoi polloi" who use metallurgical terms are so up to date.

The wording, "how martensite transforms through bainite, troostite and sorbite to pearlite," is doubtless not of the best as the authors are well aware that they all are names for certain structures seen under the microscope under variable conditions of cooling; these types of structure are, as you noted, ferrite plus a carbide in some form; it might be called an ill-defined pearlite resulting from insufficient time in cooling.

Our original article read, "how martensite transforms to pearlite through the steps called bainite, troostite and sorbite," but

the editor eliminated "the steps called" so that the implication you noted is very unfortunate. The authors had no intention of implying that there was a definite sequence of changes in these structures.

The thought behind the sentence in question was that certain structures like bainite, etc., in their change from austenite to lamellar pearlite might be blueprinted or "traced" by the use of the proper radioisotope.

The authors also wish to point out that while undoubtedly you are right in stating that the terms bainite, troostite and sorbite are old-fashioned and should be obsolete, yet every "heat treater" knows that they mean certain microstructures obtained under controlled conditions of cooling from temperatures above the critical range.

## Weighing Speeded

Sir:

I note in your issue of May 28, p. 61, a reference to a "direct reading hydraulic scale now available for one fork truck. Loads up to 4 tons are measured on pickup to within 0.02 pct accuracy."

I would appreciate the source through which we could investigate this item further.

J. C. BELLWS  
Plant Engineer

Joslyn Pacific Co.  
Los Angeles

Further information may be obtained from The Yale & Towne Mfg. Co., 405 Lexington Ave., New York 17, N. Y.—Ed.

Sir:

On the Newsfront page of your May 28 issue you have an item stating, "Hydraulic weight scale units, automatically temperature compensated from  $-70^{\circ}$  to  $150^{\circ}\text{F}$ , are now in use."

Could you supply us with further information concerning the manufacture of this item?

J. E. ZELLER  
Physical Research

Bemis Bro. Bag Co.  
Minneapolis

Contact A. H. Emery Co., Pine & Grove Sts., New Canaan, Conn., for more details on the hydraulic weight scale units.—Ed.

## Continued Interest

Sir:

We would appreciate having three sets of reprints of "Metals for Tomorrow" which appeared in your Oct. 9, 1952 issue.

H. B. STONER  
President

Williams Cutlery, Inc.  
Seaman, Ohio

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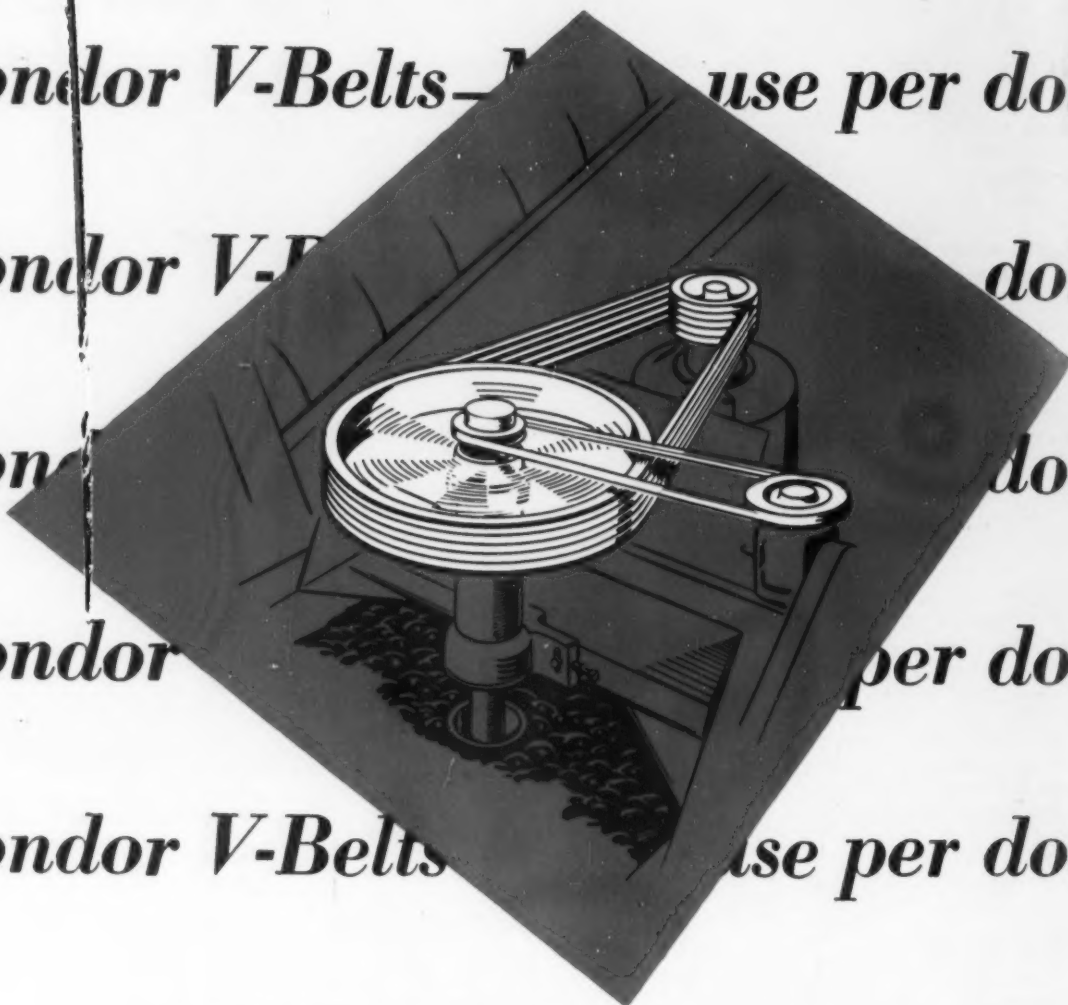
*Condor V-Belts—More use per dollar*

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*Condor V-Belts—More use per dollar*

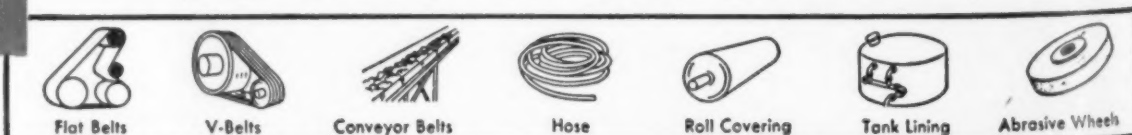
*Condor V-Belts—More use per dollar*



**LOWER V-BELT DRIVE COSTS . . .** for several reasons . . . Straight sidewalls provide more grip, less slip, longer life. Every Condor V-Belt is destretched during manufacture, and the pulling section is micro-positioned where good engineering says it should be. This gives you a smooth running drive, saves downtime for belt take-ups. You get longer V-belt life . . . **MORE USE PER DOLLAR.** Also in special oil-, heat-, and static-resisting types . . . Get the engineering facts. Ask the R/M distributor for Bulletin 6868 . . . He'll tell you, too, how you get **MORE USE PER DOLLAR** with R/M hose, transmission and conveyor belts.



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Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Teflon Products • Packings • Sintered Metal Parts • Bowling Balls



# Fatigue Cracks

by William M. Ovaltine

## Reader's Service Department

A short time ago we passed another milestone in life—and learned something. The young son and heir received his Boy Scout Cub Pin and we stood, father and son, shoulder to knee and promised to "Obey the Law of the Pack and Be Square." A proud moment. The rafters rung with "Long Live Cub Scout Dickie Ovaltine."

The glory was short-lived, however—as it always must be. We found out the hard way that there's give and take to these things. So here's a warning to our readers about what can happen if you ever promise to be square. (This is part of our regular Service Department, *Warning Division*—no extra charge).

When this formal investiture took place, we sensed, somehow, that all eyes were not on the Crown Prince as they should have been. They seemed to be centered on Pop. Absorbed in the spirit of reverence that such an occasion demands, we didn't realize at the time that the Cub Master was looking at us and saying to himself, "this guy looks like good material for Cub Master." And the Asst. Cub Master was saying to himself, "this guy looks like good material for Asst. Cub Master." And the Chairman of the Cub Committee was saying to himself, "this guy looks like good material for Chairman of the Cub Committee." And the Den Mothers were saying to themselves, "this guy looks like good material."

It didn't take long. The telephone call arrived just a few weeks later. It was the "like-to-come-over-and-see-how-we-run-things-in-the-interest-of-your-son?" sort of call. Sure. Solid citizen. How were we to know it was the selection of officers, the yearly change-over in personnel meeting? Eight good and true community-spirited citizens were to be appointed. Three square dads show up. We are now a member of the Cub Committee, the Asst. Cub Master and Secretary of Den 5, Pack 9. The Charter is saved!

We'll get even. Now that we are The Inner Council, that community is going to see the youngest Eagle Scout ever made.

## Ovaltine

No one can realize how a sensitive soul can suffer when his name is Coffey unless his name is Coffey. It's old stuff for us to be called

Drip, Grounds, Perculator, Maxwell House and so forth. But it took Arthur Godfrey's Lipton Tea Show to expose the wound to 20 million people. A fine, handsome man, Dick Coffey, appeared on this show recently and they called him Ovaltine. Please renew your subscription.

## Over Sold

In its 98 years of service as the nation's leading metalworking weekly, your ffj has been in close contact with the growing pains and applications of metals. Take Aluminum, for example.

Associate Editor Bob Hatschek, who follows the metal as if he invented it, has been expounding that aluminum statistics should be in tons instead of pounds. He also keeps a dossier (French) of new applications which he will render verbally if you take the first pitch for a strike.

But last week even Hatschek was rendered speechless by an application so ingenious it frankly had him stumped. Son Jeff, 4½ years old, decided this highly versatile metal would undoubtedly make attractive teeth. Whereupon he applied a generous coat of Aluminum paint to the entire region of his oral cavity.

There followed a series of frantic telephone calls to Papa Bob, the family Doctor, aluminum paint manufacturers and Alcoa. Result: Little Jeff feels fine, thinks all the fuss was for nothing—and he's not entirely convinced that aluminum teeth aren't still a good idea.

Our Pal, News-Market Editor Bill Packard wrote, directed and produced the above production. "Our Pal" is anyone who will do the same for future columns.

## Puzzlers

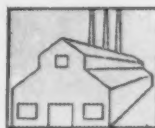
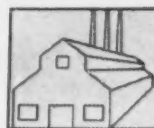
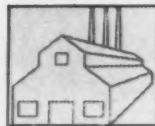
Our apologies to Mr. Rice. His solution to the "Town" puzzler was absolutely Kee-rect. So Mr. Rice's record remains unspoiled. Lt. J. R. Eliason is Kee-rect, too. Also Monica Russell, A. J. Ferro, Robert Darnell, Robert Cottingim, R. W. Shank, C. M. McFarland and J. Howarth are additional winners.

The solution to the "colored cube" problem is "10." Answers varied from 8 to 22, but Mr. Rice, J. J. Brugman and Norman Holcomb came through.

## New Puzzle

Divide \$6 between two boys so that one may have one-third more than the other.

# 4 out of 5



Since 1946, five major press plants have been built for the automotive industry to meet the increased demand for passenger cars and trucks.

Commercial Contracting Corporation was selected to install all machinery and equipment in four of these five plants.

Currently, CCC crews are beginning to place the first shipments of more than 1,000 pieces of equipment to be housed in the sixth such huge press plant constructed in the United States since the War's end.

Erecting heavy presses and other machinery is an important part of our business.

Other CCC services, provided individually or under one PACK-AGE contract, include: General Construction, Building Alterations, Demolition, Foundations, Machinery Moving, Crane and Conveyor Installing, and Steel Fabricating.

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## Dates to Remember

### Meetings

#### JUNE

**BASIC MATERIALS CONFERENCE**—Annual exposition, June 15-19, Grand Central Palace, New York. Management—Clapp & Pollak, Inc., 341 Madison Ave., New York.

**AMERICAN WELDING SOCIETY**—National spring meeting, and welding and allied industry exposition, June 16-19, Shamrock Hotel, Houston. Society headquarters are at 33 W. 39th St., New York.

**AMERICAN MANAGEMENT ASSN.**—General Management Conference, June 17-19, Statler Hotel, New York. Association headquarters are at 330 W. 42nd St., New York.

#### EXPOSITIONS

**NATIONAL METAL SHOW**—Oct. 19-23, Cleveland.

**RAILWAY SUPPLY MANUFACTURERS ASSN.**—Exhibit, June 22-27, Atlantic City, N. J. Association headquarters are at 60 E. 42nd St., New York.

**ALLOY CASTING INSTITUTE**—Annual meeting, June 28-30, The Homestead, Hot Springs, Va. Institute headquarters are at 32 Third Ave., Mineola, New York.

**AMERICAN SOCIETY OF MECHANICAL ENGINEERS**—Semiannual meeting, June 28-July 2, Statler Hotel, Los Angeles. Society headquarters are at 29 W. 39th St., New York.

**AMERICAN SOCIETY FOR TESTING MATERIALS**—Annual meeting, June 23-July 3, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J. Society headquarters are at 1916 Race St., Philadelphia.

#### JULY

**TRUCK TRAILER MANUFACTURERS ASSN.**—Annual summer meeting, July 23-24, Edgewater Beach Hotel, Chicago. Association headquarters are at 1024 National Press Bldg., Washington.

**NATIONAL TOOL & DIE MANUFACTURERS ASSN.**—Summer meeting, July 30-Aug. 1, Milwaukee. Association headquarters are at 907 Public Square Bldg., Cleveland.

#### AUGUST

**WESTERN ELECTRONIC SHOW & CONVENTION**—Aug. 19-21, Civic Auditorium, San Francisco. Headquarters are at 1355 Market St., San Francisco.

**NATIONAL AUTOMATIC MERCHANDISING ASSN.**—Convention & Exhibit, Aug. 23-26, Conrad Hilton Hotel, Chicago. Association headquarters are at 7 S. Dearborn St., Chicago.

#### SEPTEMBER

**ELECTROCHEMICAL SOCIETY**—Fall meeting, Sept. 13-17, Wrightsville Beach, N. C. Society headquarters are at 235 W. 102nd St., New York.

*The operator who uses old style gages is working blind!*



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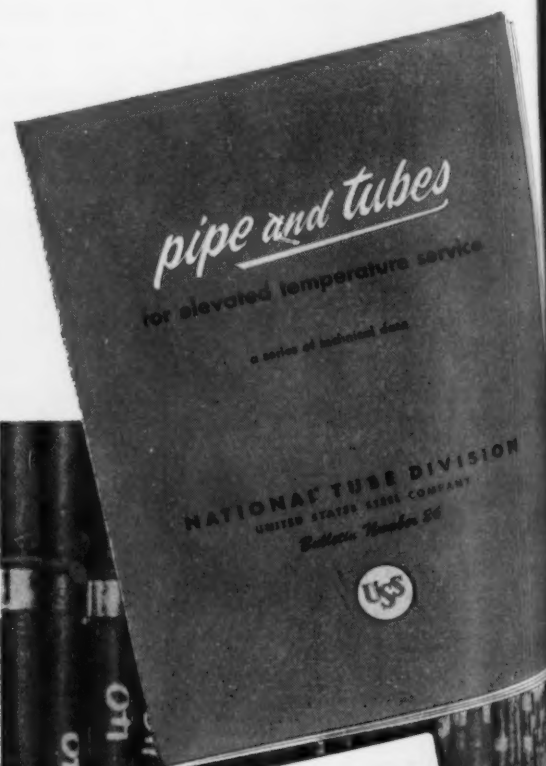


IF YOU'RE CONCERNED with the piping requirements of a modern, high-pressure, steam station, this book with its practical data and information will greatly help you in the piping design and assure better results from its application. Just ask for a copy of Bulletin 10—Power Plant Piping.

THE equipment you use today must meet demands far more severe than those of only a few years ago. That's because stepped up operations, in industrial processing of all kinds and in the more efficient production of steam and power, are continually calling for higher temperatures and pressures.

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IN THIS RECENTLY PUBLISHED BULLETIN 26, you will find a complete and authoritative guide to the selection of the right analysis of pipe and tubing for handling elevated temperatures. The technical data covers 26 different steel analyses representing a wide variety of chemical compositions that are of special interest to users of tubular products who are concerned primarily with elevated temperature properties. Send for your copy.



## THE IRON AGE Newsfront

USED MACHINERY DEALERS ARE CONVINCED they will have a good civilian market if a truce is signed in Korea. They believe their industry will revert to more normal practices after the fighting is over and an adjustment has been made. Optimism is based mainly on pent up demand for a variety of civilian needs.

PLENTY OF HAND LABOR is required to finish plastic automobile bodies. At least as many man-hours are needed to finish a plastic car body as are required to finish a steel car body.

NATURAL GAS RESERVES CONTINUE TO INCREASE despite record withdrawals. Proven recoverable reserves in U. S. at end of 1952 totaled nearly 200 trillion cu ft compared with 194 trillion cu ft a year earlier. An all-time record 8.6 trillion cu ft was consumed in 1952.

WATCH FOR OPENING of a National DEP (Dynamic Equipment Policy) Center in the Midwest this fall. The Center, with study and research facilities, will seek to determine the point at which capital equipment is no longer a profit producer and should be replaced.

HOT SPRAY PAINTING is getting a lot of attention in auto industry development work. And at least one auto firm is already employing the method in production.

GREATER RESISTANCE TO ABRASIVE WEAR in neoprene coated fiber glass fabric has been made possible through use of a new synthetic polymer. Resistance to this type of wear has been increased up to 200 times. The fabric is used in producing flexible ducting for applications where vibration causes continual rubbing.

IRON POWDER HAS BEEN MIXED WITH PLASTIC for form dies. Aim is to attain longer die life through greater resistance to abrasion. Results from the experimental work are promising.

RADIO-RADAR REQUIREMENTS of the oil industry will probably expand with clarification of offshore oil jurisdictional questions. The industry is already the largest single operator of microwave system mileage, some 600 users operating 22,000 transmitters.

RENT AND DRIVE cars operated 1.3 billion miles in this country during 1951, a recent survey shows. Average mileage per vehicle was 13,903 miles. More than 160,000 cars are now available on short or long term lease.

TRUER, CLEANER CASTINGS are reported possible with use of foundry sand treated with a resin. The resin, at proportions of 1 lb to a ton of sand, improves foundry operations by giving a better distribution of sand. About 1/16 of the resin is burned out and must be replaced each time the sand is used.

PLASTIC TANKS FOR KEEPING FRESH WATER AND OIL aboard ships is recent Navy experiment. Fiber glass reinforced with plastic is used in place of usual metal tanks. Experimental tanks range from 100 to 1700 gal and will be tried on five minesweeper auxiliaries.



# History in the Making

**MEN WITH  
A VISION  
AND A  
PURPOSE**



## **THE CLEVELAND MEN**

Under authority of a special act of the Michigan legislature, on December 26, 1850 "The Cleveland Men" met at the old Canal Bank in Cleveland, Ohio to form The Cleveland Iron Mining Company. From this beginning grew The Cleveland-Cliffs Iron Company. This pioneering undertaking was one of the initial steps in the founding of the great Lake Superior iron ore industry.

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# STEEL: Price Rise Will Follow Wage Hike

**New steel union contract will bring base price increases of about \$4 per ton . . . Metalworkers will feel wage pressure . . . Washington kept hands off—By J. B. Delaney.**

New steel labor agreements re-establish free collective bargaining in the steel industry. This is something the industry has been trying to accomplish since before the war. It has proved its case.

Most significant—and happiest—aspect of the agreement reached last week by U. S. Steel Corp. and United Steelworkers of America, CIO, is that it was done without government interference. There was never a hint of government influence during the talks.

## What It Does

The agreement, effective June 12, calls for a pay increase amounting to over 9¢ an hr for U. S. Steel, and raises its basic pay rate to \$1.52. The increase includes an across-the-board boost of 8½¢ an hr and eventual elimination of the existing 5-cent differential between northern and southern plants of the corporation. Two and one-half cents will be eliminated Jan. 1, 1954 and the balance on July 1, 1954. U. S. Steel also agreed to a joint study of insurance and pensions "in anticipation of bargaining next year."

The 8½¢ increase will be extended to the entire basic steel industry and ultimately to steel fabricators. Only other major producer that will be affected by the North-South differential clause is Republic Steel Corp. Over 1,200,000 union members will be affected, 600,000 of them in basic steel. Basic steel labor costs will be up approximately \$110 million annually on the basis of a 40-hour week, excluding overtime.

Signing of the contract between U. S. Steel and the union took place

at 3.45 p.m., last Friday, less than an hour after the union's Wage Policy Committee gave its approval. The union's International Executive Board approved it in a record-breaking 40-minute session Friday morning.

Representatives of Bethlehem Steel, Republic, Jones & Laughlin, and Youngstown Sheet & Tube were standing by awaiting formal rati-



**DRAMATIC MOMENT'S** at hand as David J. McDonald, the steel union's new president (left) signs wage pact with John A. Stephens (center), vice-president of U. S. Steel.

fication of the new contract terms, and formal agreements with these companies were signed late Friday. Other companies will fall into line this week.

THE IRON AGE predicted even before negotiations started that the settlement would be "in the neighborhood" of 10¢ an hour. (THE IRON AGE, May 7, 1953, p. 147.)

Apart from proving that give-and-take bargaining between management and labor in steel is not only desirable, but possible, the new agreement means:

1. Steel base prices will rise approximately \$4 per ton. This is based on the industry's position that production costs are increased 20¢ per ton for every 1¢ boost in pay. Increased cost of goods and services, which inevitably follows, accounts for the remainder.

2. David J. McDonald, the union's new president, is firmly established as a potent bargainer for the steelworkers. The agreement disproves unfounded reports that Mr. McDonald would be a pushover for the steel industry in his first real test as successor to the late Philip

Murray. It also confounds his enemies within his own union and the union movement generally who would have liked to see him muff this one. Mr. McDonald's re-election as union president years hence seems assured.

3. It brings closer a good will tour of U. S. Steel plants by Mr. McDonald and Benjamin F. Fairless, U. S. Steel chairman. (THE IRON AGE, Aug. 7, 1952, p. 66.) This tour originally was to have been made last year by Mr. Fairless and Mr. Murray but was never



## Labor and Management Say:

C. F. Hood, president of United States Steel Corp.:

The increase covers the production and maintenance employees of the steel producing divisions of United States Steel and will be applied uniformly to each of the rates in the 32 job class rate scale now in effect.

Recalling last year's wage settlement, which averaged 16¢ per hour and provided other substantial benefits such as vacations and paid holidays, Mr. Hood declared that two factors nevertheless required an adjustment in steel wages this year. The first of these stressed by Mr. Hood is the desire of the corporation to have employees of United States Steel feel they are fairly treated. The second, and related factor, is the wage increases which have been occurring throughout the year, particularly those announced in recent weeks in other industries.

The Aug. 15, 1952 labor agreement under which the present reopening on wage rates occurred, will now continue with the changes above indicated to its termination date, June 30, 1954.

David J. McDonald, president of United Steelworkers of America:

We have reached an agreement with the United States Steel Corp.

The wage increase, all factors considered, amounts to about 10¢ an hour.

While the immediate increase applies to the steel producing firms, we have an understanding that the same increase will be applied to the other subsidiaries of U. S. Steel, such as the iron ore mines.

I am happy that we were able to resolve our problems over the collective bargaining table. That is the American system—and I like the American system.

Wage increases for the steelworkers are a contribution to our whole economy—for the professional man, the farmer, for everybody in the community.

I hope our relationship in the steel industry will continue on the same high plane, as exemplified in these negotiations.

realized due to the death of the union leader. Both Mr. McDonald and Mr. Fairless are eager to make the tour.

### Goals to Go

The agreement also leaves the union free to concentrate on 1954, when contracts with the steel industry expire in their entirety. It has four things in mind: A wage increase, higher pensions, improved social insurance program, and a further study of the guaranteed annual wage.

Mr. McDonald has indicated he will have his guns loaded for 1954. On pensions, he is believed to be thinking in terms of \$137-\$150 per

month minimum, including social security, for workers with 25 years experience when they retire at 65. Present minimum is \$100 per month, including social security.

Union leaders feel the industry should hike their share, especially in view of social security law changes that have reduced company contributions to the pensions. Mr. McDonald also is influenced by recent agreements in the automobile industry that raised auto pensions to \$137 per month. The steel plan is non-contributor.

Depending on the economic picture next year, Mr. McDonald may or may not apply too much pressure on wages. Now that he has one

wage boost under his belt, he can afford to indulge in a bit of statemanship on pay and trade off for improvements in pensions and social insurance. Nothing much is likely to happen on the guaranteed annual wage, although the union will make considerable noise over this issue.

### Outlook Was Promising

The agreement was hammered out in true collective bargaining fashion. Negotiations began in Pittsburgh on May 14, but the first wage offer of 5¢ an hr was not made until June 4 or 5. The union turned it down. But the outlook was so promising that Mr. McDonald summoned his International Executive Board and Wage Policy Committee to a meeting last Friday.

In the interim he persuaded the company to boost the ante to the point where he could recommend acceptance. This was accomplished last Thursday in a series of meetings between Mr. McDonald and John A. Stephens, vice-president industrial relations, U. S. Steel, and a select group of close advisers for both sides. Settlement terms were ratified by union leaders last Friday.

### A Fair Shake

Outcome of the bargaining was more in line with union thinking of what they ought to get than initial industry sentiment. The union all along figured it could keep the membership happy with 10¢. Most industry leaders thought they could swing the deal with 5¢.

The industry's willingness to concede the difference in the interest of peace is as much a tribute to its desire to be reasonable with its employees as it is to the persuasiveness of union bargainers.

Peaceful agreement on wages leaves the industry free to concentrate on production and sales; a record year is practically assured. Raw materials are in good supply, and the industry's real annual capacity is around 120 million net tons. Despite fear of last quarter letdown, this may be a 112 million ton year.



# INDUSTRY: Cooperates With Capitol

Steelmen seek better government relationship . . . Oil industry shows the way . . . Justice Dept. studies plan . . . Organization outlined . . . Others may follow—By G. H. Baker.

Steel industry relations with the Federal Government may be entering a bright new era of intelligent and worthwhile cooperation. If plans now being studied by the Justice Dept. are approved, the industry may, within the next few weeks, find itself on the threshold of a joint industry-government program. Goals include greater efficiency in steel production and better industry-government integration of mobilization preparedness plans.

During the past 20 years, the pattern of dealings between Washington and the industry in such basic problems as capacity, production, and distribution of steel products has often been marred by a lack of understanding the other side's point of view.

## Oil Industry Has One

Government officials were accused—often properly—of attacking the industry for purely political reasons. And the industry frequently found itself the target of unjust criticism by federal officialdom. Stung by such charges, individual companies have heaved a few brickbats of their own in the direction of the Capitol and the White House. Result: nobody gained and defense production was not advanced.

Leaders in steel and other heavy industries have long admired the smooth operation of the National Petroleum Council. They would like to duplicate its success. Although NPC works in close cooperation with the Interior Dept., it sets its own agenda, talks frankly with the government in questions of expansion or cutback and carefully avoids any dabbling in questions related to industry-wide pricing or allocation of production and marketing among its members.

Biggest fear of all management people in the operation of industry-government groups like the NPC is that their actions may some day

set off a rock-slide of federal anti-trust action. They are justifiably skittish about taking any concerted action as an industry, for Washington has its share of headline-hungry politicians who are willing and able to holler "collusion," "price-fixing deal," or "dividing the market" at the first suggestion that officials of two or more companies in the same industry had lunch together in Washington.

## Outline Steel Plan

No one is willing to make a move, as a result, until the Justice Dept. gives the nod to the setting up of any industry-wide organization in Washington. Threat of prosecution by the Justice Dept. Antitrust Div. or the Federal Trade Commission is too great to warrant the risk.

Steel industry plan, as outlined in the proposal now receiving the eagle-eye treatment from the Justice Dept., includes the following key points:

1. Membership, which is to be drawn from top-level steel company executives, is to be selected by the Secretary of Commerce. Both large and small companies are to be represented. Each member is to serve for 1 year.

2. Chairman is to be selected by the members, not appointed by the government.

3. Meetings are to be held quarterly, but may be called more often at government request.

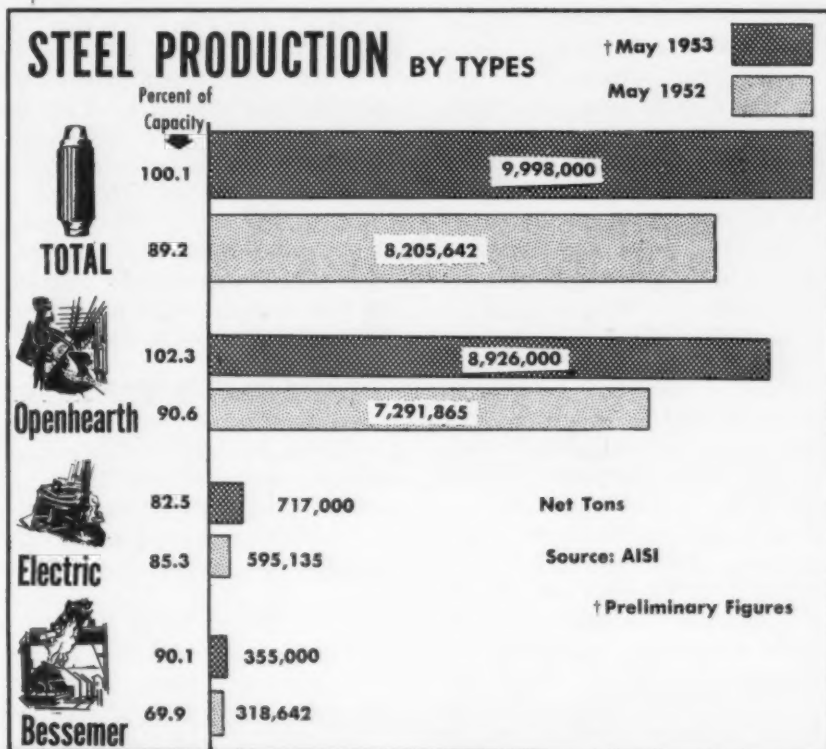
4. Committee is to be financed by voluntary contributions from the industry.

5. Committee is to hire its own permanent staff, and is to initiate staff studies dealing with such subjects as production, marketing, distribution, capacity, mobilization preparedness, mobilization base, and post-attack operations.

Problems involving prices are to be strictly avoided.

Justice Dept. attorneys are taking their time in studying the proposition. Their views may not become known for several weeks.

Similar industry committee plans, covering the aluminum and chemical industries, are reported to be in the works, and are also awaiting Justice Dept. comment.





# TITANIUM: Straining To Fill Needs

**Industry and government people concerned about supply outlook . . . Spongemaking capacity is a bottleneck . . . Progressive expansion keeps pressure on industry—By R. M. Lorz.**

Industry and government officials are getting concerned about titanium. Possibility of a fourth quarter shortage for critical air force needs is already causing rumbles in the industry.

NPA recently met with industry advisors and suggested that special directives might have to be issued to help speed the metal to military users.

## Had to Substitute Stainless

The move was taken after Air Force officials at Wright Patterson field complained that slow deliveries of the scarce metal had caused some dislocations in May and June. One official in Washington said there had been instances in which stainless steel had been used as a last minute substitute in applications which had originally called for titanium.

Specific shortages are difficult to pinpoint because of the veil of security which surrounds titanium's military applications. But it is common knowledge that demand for wide and thin gage sheet and forgings has been terrific.

Titanium producers and fabricators admit there is a shortage and explain that they are doing their utmost to ease the situation. They say there is no problem as far as melting capacity and supply of raw materials are concerned. The real stumper is titanium sponge.

At present DuPont and Titanium Metals Corp. are the only producers. A trickle of material is coming in from Japan and the U. S. Bureau of Mines, but it is insignificant when lined up alongside industrial requirements.

Estimating current requirements for sponge is tricky; enthusiastic acceptance of the new metal may have spurred optimism unduly. While some assume that production is currently running at 20 tons per day, informed sources say actual output isn't nearly that high. Reach-

## Titanium Sponge Goals

### Anticipated Production

#### Net Tons

1953	3,400
1954	7,200
1955	15,000
1956	18,600

ing the 20-tons-per day figure will be an uphill fight which might take until next January.

Statements like these put a real damper on the industry's announced goal of 3400 tons for 1953. Some observers close to the situation feel the year's output will probably be nearer 2400 tons.

What can be done to speed production? The answer is obviously to increase capacity for sponge production. But this is easier said than done.

At the moment there is talk in Washington to the effect that the Crane Co. of Chicago will soon be given a contract which could eventually increase production of sponge by 6000 tons per year. Here again over optimism may cause some headaches. While some believe that Crane could set up its proposed plant in Nashville in 18 months, other more conservative guessers say that erection of any new sponge plant will take close to 2 years.

## Need Scrap Reclamation

Expansion of present facilities is also being considered. Government officials reportedly have asked one producer to up production greatly.

Executives aren't overlooking the possibility of getting more out of existing facilities. Production of useable titanium scrap is getting most of the attention in this sphere.

Big stumbling block in scrap so far has been the lack of facilities for handling larger pieces as well

as light scrap. Defense Dept. spokesmen say a conservation program has been launched to segregate scrap and hold it for melters.

This step, which will pave the way for reclamation of scrap through toll arrangements, should increase overall supply. But there apparently will be a scrap problem until more producers of titanium products devise better ways of melting large pieces of scrap. Industrial and refractory furnaces can't do the job and melting furnaces can only be used for granulated material. Importance of this problem can be readily seen when it is pointed out that it is sometimes necessary to whittle away 70 percent of a titanium forging destined for the defense effort. If this scrap can be effectively recycled gains should be tremendous.

## Have No Materials Problem

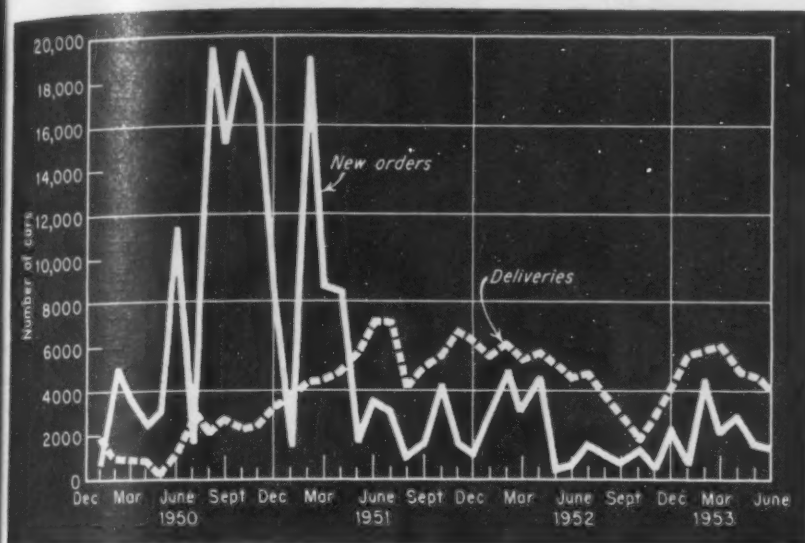
Authorities who claim melting capacity and raw materials are not a problem indicate that it would be no trick to increase melting operations almost immediately.

Supply of raw materials is also abundant since titanium is the fourth most abundant element in the earth's crust. Richest deposits have so far been found in rutile sand, but brookite, and titania slag are also considered good sources. Sponge producers, who say the cost of processing is about the same for all 4 materials, are looking to Canada and its titania slag as a likely hunting ground. They believe mining operations similar to the Kennebecott-New Jersey Zinc development will provide plenty of raw material.

Producers are also striving to reduce cost by perfecting new methods of purifying oxides. (Possibility of purifying T-102 electrolytically falls in this category.) Need for newer methods is paramount since the Kroll process is the only one in use currently.

Producers are going all out in an effort to insure greater production. Their only request at the moment is for consideration of the hurdles they face in a new industry. Their big jobs are boosting production, getting trained personnel, solving monumental technological problems, and reducing cost.





## FREIGHT CARS: Look Out Below

**Freight car order backlogs continue rapid slide . . . Have dropped from 113,713 to 33,770 in last 2 years . . . No easing expected . . . Car supply adequate—By E. C. Kellogg.**

There's no panic—freight car builders have been out of control on the downhill grade too often in the past. But concern is growing.

Since reaching a crest of 113,713 orders in April, 1951, commercial freight car builders' backlogs have dropped for 26 months in a row. And this month plummeted past the 33,770 mark without any sign of slowing.

### Railroads Hit Too

Cause of the backlog decline has been failure of new freight orders to keep up with no better than average production. Since January, cars have been delivered almost twice as fast as new orders were booked.

Total deliveries for the 5-month period amounted to 25,649 as compared with new orders for 12,925 freight cars. The 2-1 rate of decline has pushed backlogs down from a January level of 47,237 to less than 34,000 at the beginning of this month.

Condition in the railroads' car-building shops is the same. Backlog high point for these car shops was October, 1951, when they had

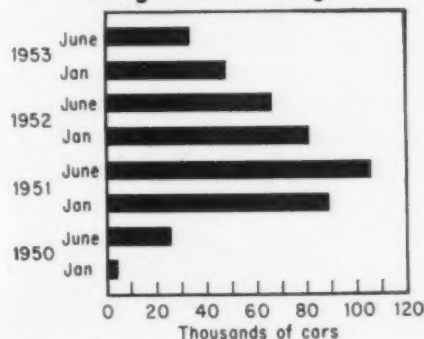
orders for 45,904 cars on their books. The total now is less than 23,575.

### Shutdowns Coming

If freight car orders don't increase soon (builders frankly admit that they don't anticipate a surge in demand), industry sources believe backlogs will hit bottom in about 8 months. Fourth quarter has been circled on car builders' calendars as the critical period. If new orders have not picked up by then, builders may have to start closing down their shops.

Car builders report they are further harassed by a shortage of heavy plates and structurals. One

### Freight Car Backlogs



builder told THE IRON AGE that the steel scarcity is the worst his company has experienced. He expected that at least one of his shops would have to shut down late this summer because not enough steel is coming through. Other builders with smaller orders say they find that their supply of steel is easing slightly.

Prospects are that the current plunge of freight car orders will not end in the near future. Railroads are generally complacent about the number of cars they now have on the rails which on Jan. 1 totaled 1,756,700. They believe this number is sufficient to take care of current freight loadings which are running slightly behind last year's rate.

All industry sources agree that there is no shortage of freight cars at present, and this undoubtedly is partly responsible for the railroads' reluctance to step up their order rate.

One industry spokesman estimated that there was a surplus of 40,000 freight cars, but said this excess was restricted to specific types of cars, particularly hoppers, as demand for these cars has waned with the slump in coal shipments.

### Await ICC Verdict

Other factors limiting railroad demand for freight cars is the tightening money supply and indecision about whether the 15 pct freight rate increase granted last year will be made permanent or will run out as scheduled on Feb. 28, 1954.

The freight rate hike, put into effect on a temporary basis by the Interstate Commerce Commission last May, resulted in a substantial increase in freight revenue during the last 9 months of 1952. American Assn. of Railroads says the railroads can't plan future expenditures until they know how much money will be coming in.

ICC started hearings on June 15 to decide whether or not to make the increase permanent. There were no bets on what its decision

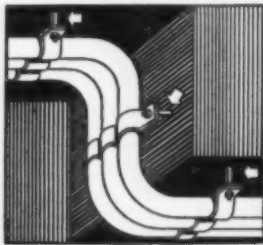


		
END-WELDS STUDS TO STEEL IN A SPLIT-SECOND	ELIMINATES DRILLING, TAPPING, HAND WELDING	REDUCES MATERIAL HANDLING—TAKES THE TOOL TO THE WORK
		
	SAVES STEEL—ELIMINATES HEAVY BOSSES AND FLANGES	IMPROVES PRODUCT DESIGN AND QUALITY

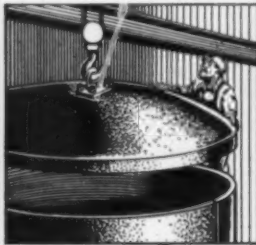
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## Production

would be. Verdict is expected within 30 days.

Best hope for the car builders right now is that the railroads will keep up their freight car retirement programs and will eventually have to start placing more orders to stay in business.

### Hope for Replacements

Normal retirement age for freight cars is about 30 years, and a recent survey by the American Railway Car Institute showed that nearly 17 pct of the cars owned by Class I railroads (firms having a revenue of \$1 million or more per year) are overage. This means that nearly 295,000 freight cars will have to be replaced, if the railroads are to maintain their present service capacity.

Car builders warn that there may be trouble if their backlogs continue to fall. If production has to be cut drastically many of the 21,000 workers now employed by the car builders will have to be laid off. Skilled workers are sure to be grabbed in the current labor-short market, and car builders say this will make it difficult for them to get back into production if more freight cars are needed.

Back of the car builders' concern over slimming backlogs, however, is confidence that the current trend will eventually reverse itself as it always has in the past history of this most violently cyclical of all industries.





## STEERING: Power Boost Catches On

**SAE holds summer meeting . . . Power steering is center of interest . . . Over 10 pct of new cars have it . . . May double by end of '54 . . . Plastic interest high—By W. G. Patton.**

Power steering, hardly a speck on the automotive horizon less than 2 years ago, has reaped such enthusiastic public acceptance even its backers are surprised.

This latest entry into the large auto accessory field was given the acclaim it had earned at the Society of Automotive Engineers' annual summer meeting held in Atlantic City last week.

### Didn't Follow Pattern

Power steering has taken such a hold in the accessory market that eventually it may eclipse automatic transmissions, predicted C. W. Lincoln, chief engineer of Saginaw Steering Gear Div., General Motors, largest power steering producer. He also foresees a 10 to 15 pct cost reduction in 1954 models.

With the initial success gained in big, off-the-road vehicles, it was supposed that power steering would gravitate naturally through the truck field and eventually into passenger cars. But it didn't work that way. Truck buyers resisted. And yet the public reacted so enthusiastically when Gemmer Mfg. Co. introduced the innovation for passenger cars less than 2 years ago that five manufacturers are already in the race.

Bendix Products Div., Ross Gear & Tool Co. and Monroe Auto Equipment Co. round out the five. Although not officially announced, it is expected that Chrysler Corp. will soon start producing a power steering device of its own design at the Trenton, Mich., plant.

### Will Boost Output

By the end of this year every U. S. passenger car is expected to offer power steering. It's already standard on Buick's largest model and 95 pct of Cadillacs are so equipped. More than 10 pct of all cars sold today have power steering boosters and the percentage may easily top 20 by the end of next

year. Add the potential application to farm tractors, trucks and buses and the future seems assured.

Saginaw has already built more than 500,000 units, is now tooling for a substantial production boost. Saginaw's output to date is all of the integral type but a new linkage type will soon go into production.

The two available types differ in mounting position of the pump and power cylinder. Power system in the integral type is under the hood. In the linkage system the device is closer to the front wheels, with at least part of the power system outside of the engine compartment. All of the most recently introduced devices are of the linkage type.

### Describe Plastic Uses

Interest in plastics also ran high at the meeting. The number of applications for passenger cars is growing at a tremendous rate. Most recent estimates place the total use for decorative and functional plastic parts at about 9 lb per car.

New decorative effects combining

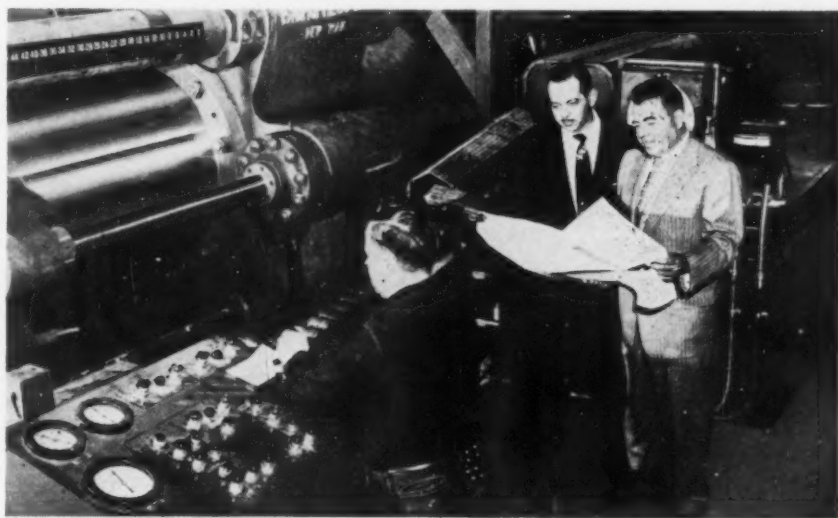
metal and plastics include the growing use of vacuum plating of metals, such as aluminum, on plastic. Illustrating the advantages in some functional parts is the use of a nylon gear for a speedometer. Savings have been as much as 50 pct on the finished part, it needs no lubrication, it is quiet running and it has an excellent service life, according to Parke Woodworth of E. I. DuPont de Nemours & Co., one of the panel members.

### Finish Takes Work

Engineers agree that plastic bodies for sport cars are still experimental. Those now being built can hardly be evaluated in terms of cost and adaptability to volume production.

Considerable hand labor is needed to produce a satisfactory finish on plastic bodies produced up to the present. Although improvement in die design and die finish may help, at least as much manual effort will be required to finish a plastic body as is now needed to prepare a steel body prior to painting. Under present conditions the cost of a plastic laminate may be five or six times the cost of a comparable steel shape.

One recent development is the use of iron powder with the binder resin to improve the resistance of plastic form dies to abrasion.



NEW SOURCE of aluminum sheet, coil and extrusions becomes available this month to Michigan's 1400 white metal fabricators as Wisco Aluminum Co of Lincoln Park enters the fully-integrated mill field. Annual capacity will be 12,000 tons of finished coil and 5,500 tons of extruded shapes. Photo shows Robert Greenberg, executive vice-president, left, and Robert Wisck, president, checking extrusion press operation and pulpit control.



## "BSA": New Agency to Help Business

**Commerce Dept. being streamlined, headed back at original goals . . . Business Services Administration will take over from other agencies on July 1.—By A. K. Rannells.**

Commerce Dept. is readying itself for a major step—a step designed to get the department back to its originally intended job of fostering, promoting and developing industry, business and commerce in general. Business Services Administration will be established on July 1.

It will swallow up the expiring National Production Authority to the extent of those services being retained, and will absorb three existing Commerce Dept. bureaus.

Blueprint of the setup went to the Budget Bureau recently. Skelletal framework of the agency was sketched last week by Secretary Weeks to sales executives meeting in Atlantic City—indicating assurance that Budget Director Dodge would okay the plan except for minor changes.

### Give Organization Details

As charted by Commerce Dept., BSA would at first stand on four legs, three of which already exist—Office of Business Economics, Office of Technical Services, and the newer Office of Distribution.

Fourth leg would be an Office of Mobilization program coordination. A fifth leg is to be added in a year or so—the Office of Small Business. At present, this is being established by Congress as the Small Business Administration, an independent agency.

Heading up the BSA will be a top-flight executive from the industrial and business world, without pay and on a rotating basis. His major job will be to direct policy.

### Plan 23 Divisions

Actual operation will be handled by a deputy director, and assistants if needed, drawn from the paid ranks of department career employees.

Into this overall setup will be

moved the trimmed-down framework of National Production Authority.

Some 23 major divisions are planned. They include iron and steel, copper, aluminum, other metals and minerals, motor vehicles and aircraft, metalworking equipment, industrial equipment, railroads-shipbuilding-ordnance, electrical power equipment, construction and building materials, and so on.

Here again, Commerce Dept. plans to draw on the best brains of industry and business for division chairman, non-paid and rotating. A deputy will be supplied for operational direction.

### Covers Special Cases

Industry advisory committees will be continued as they were under NPA, the earlier office of industry cooperation, and during the

### "Foster, Promote, Develop"

The Commerce Dept. — To quote the statutory language—should 'foster, promote and develop commerce, manufacturing, shipping transportation' and other phases of industry . . .

"... I (have) discovered in amazement that the direct business services, for which Congress established a Commerce Dept., had been so watered down that less money was in the outgoing administration's budget than was appropriated in Hoover's day.

"I'm going to do the best to strengthen these functions so they can do the job imposed by law."

—Commerce Secretary Sinclair Weeks, before convention of National Sales Executives, Inc., Atlantic City, June 9.

early days of the department.

Various industries, not covered by the 23 major divisions, will have their own special subdivisions.

Roughly, the more specific functions of the new BSA boil down to:

- (1) Handling of production directives and allocations of materials for the military, defense, and atomic energy needs. This work will gradually decline.
- (2) Provision of an information service for business and industry. This would be handled through the industry divisions and subdivisions.
- (3) Coordination of various industry plans for mobilization bases and post-attack programs, with an eye to keeping them up-to-date and integrated.
- (4) Acting as a liaison agency for business and government on legislative and administrative matters, giving business a stronger voice in approving, disapproving, or suggesting of policy and plans from a practical working viewpoint.
- (5) Providing for the first time a way for giving distribution industries a top voice and place in the industrial and business setup.

This latter will be provided through the Office of Distribution, organized late last year on the basis that if sales and distribution are carried on at a high level, high production necessarily follows.

"This is not adding another leg to the federal centipede," Secretary Weeks says. "It is consolidating several current functions into a more compact and efficient unit (and) pooling the best brains of industry on problems of improving Commerce services."

While final details had not been worked out early this week, belief was that H. B. McCoy, now head of Commerce Dept. Office of Industry and Commerce, would be chief deputy of the new BSA.



# MEMORY: Executives Shouldn't Forget

**Memory course helps businessmen remember facts, faces and names . . . Ability to remember often means advancement and higher salaries for executives—By T. Metaxas.**

How would you like to be able to scan 75 pages of *IRON AGE*, or any other periodical, and then be able to remember generally but accurately what was on each page? Or how would you like to meet 30 or 40 possibly helpful business contacts at a convention and be able to remember not only their faces but also their names and occupations?

Last Monday night 38 metalworking executives proved they could do just that when they were presented diplomas on graduating from Dr. Bruno Furst's School of Memory. Their memory feats smacked of the magical.

## Increase Your Effectiveness

In the first test, *IRON AGE* and two other business magazines were passed out to the audience. Graduates then "remembered" what was on any of the specified 75 pages. Twenty objects were listed and the grads called them back in sequence or out of sequence. They also remembered a week's schedule of appointments, a long series of telephone numbers and machinery specifications—all volunteered by the audience.

These executives, however, had not spent 10 weeks, studying 2 hr a week at Dr. Furst's school at Steinway Hall, 113 W. 57th St., New York, to learn parlor tricks. They made their memories reasonably foolproof to increase their effectiveness in business life. How much time is wasted, how much embarrassment is caused by faulty memories in business cannot be calculated, but it is considerable.

Briefly stated, Dr. Furst works on the principle that memory, like an organ of the body, degenerates through disuse or misuse—but with planned exercise, memory achieves remarkable powers.

Almost anyone in any walk of life can use a reliable memory, says Dr. Furst. But professional and business men have most to gain, be-

cause for them it can mean advancement, more money and better business. One-third of Dr. Furst's students at his regular classes are businessmen and he has made arrangements with firms to conduct in-plant memory courses for their executives.

To a businessman, a good memory means having facts, figures, and faces at his mental fingertips. Importance of this faculty to an executive or a salesman is apparent—it means he can remember appointments, important phone numbers, facts on production and products.

Businessmen can have a field day of self-improvement in public speaking, says Dr. Furst, if their memory can make them fluent in recalling pages of prose without reference to paper. It means relaxation of tension and a spontaneous attitude before an audience.

## Means More Money

One businessman graduate of the memory course told *IRON AGE* he was able to memorize a mass of production figures and statistics, and when he went before his board of directors to push a special project he astounded them with all the facts he had at his command.

"They thought that I must have been working on this thing since I was 12 years old," he said.

*IRON AGE* studied many testimonial letters from graduates of the course. All of them spoke of self-improvement, highly increased efficiency, greater incomes.

Although many businessmen shy away from any scheme that seems to have "get rich quick" aspects, Dr. Furst says that more and more are enrolling. For National Metal Trades Assn. he gave a course tailored to specific business needs, deleting some of the civilian frills. Most of his businessman graduates take the course on their own initiative.

Dr. Furst, who escaped from Hit-



DR. BRUNO FURST

ler and came to the U. S. in 1938, believes the best way to remember is to form hooks of associations and ideas on which to hang your facts until needed.

His memory course was introduced to NMTA when an enthusiastic graduate, Norman L. Rowe, Ideal Roller and Manufacturing Co., Long Island, arranged a memory demonstration at a Lake George convention. The New York - New Jersey branch of NMTA was the first to arrange for the special businessman's course and now plans to have another one.

Others in process of planning for courses include the New Haven and Syracuse branches of NMTA. Chambers of Commerce are also showing interest, says Dr. Furst.

## No Need for Memos

Dr. Furst has his headquarters in New York and branches in several cities. For those cities in which he is not represented he offers correspondence courses.

Students of the 13 companies which took the course and graduated last Monday ranged from presidents to foremen. One secretary took the course at the insistence of a fellow student, her boss, R. F. Dede, vice-president of New Jersey Machine Corp., who said: "If the course is good enough for the boss it's good enough for his secretary." He is counting on the memo pad vanishing from his office.





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## “Wyandotte Industrial No. 6 is the **BEST NEUTRALIZER** we’ve ever used!” —*Magic Chef, Inc.*

Magic Chef, Inc., St. Louis, Missouri, produces high quality ranges. Naturally, they demand high quality products in their processing operations. Read what they say about Wyandotte Industrial No. 6:

“Industrial No. 6 completely eliminated two problems we previously had,” reports Mr. Martin Haselhorst, Enamel Superintendent at Magic Chef. “One was the hanging which resulted where two pieces of ware touched in the pickle basket to cause slow draining of ordinary neutralizer solutions.

“The other problem was excessive foaming which made it impossible to operate the neutralizer tank at more than 190° F. At this temperature the drying of the ware was a problem.

“Wyandotte Industrial No. 6

has eliminated the hanging which reduced ‘wash-off’ considerably. Also, we now get better drying because we can raise the neutralizer bath’s temperature to 210° F. without a foaming problem.

“We also use another specialized Wyandotte product with excellent results for alkaline cleaning in our pickling department. With the use of Wyandotte cleaners we have been able to reduce our costs and improve our products.”

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## Distribution

### WAREHOUSES: Can

Steel distributors can sell more steel than they can get . . . Mills cut shipments.

Predictors of easy steel in third quarter will get scant comfort from the warehouse industry. Warehouses are still having difficulty meeting demand, still have unbalanced inventories, still do some conversion, and now are having increasing difficulty in getting some types of steel.

One large warehouse was cut back 10 pct on mill allotments of sheet, 25 pct on beams, 50 pct on plates for third quarter. Another, which has customarily handled small tonnages of seamless tube, was warned that its third quarter shipments would have to be reduced 40 pct.

### Return to Normal

A third warehouse indicates reductions in third quarter allotments almost across the board of 10-30 pct, more in seamless tube.

Generally, warehousemen have been accepting cuts gracefully. As one put it, “We received a full 100 pct allocation of mill steel under government directives when some industry was getting 60 pct or less.

“What we’re seeing now is a return to the old, normal distribution pattern. It’s an attempt to normalize the ratio between mill steel shipped to the direct consumer and mill steel shipped to the warehouses.”

### Lose Buyers?

Net effect has been dark doubt in some cases. One warehouseman points out that, unless automotive buying cuts back, his inventory will still be skeletal in third quarter.

Another says this means marginal buyers may begin to buy direct from the mill again, rather than from the warehouse as they have done for the past 2 years.

Warehouses, along with the rest of industry, lost 2 month’s mill carryover for July. This steel ex-



## Sell More Steel

isted on paper only, since it had not been delivered, and there was no change in the volume of steel actually delivered. But real reduction of mill tonnage delivered to warehouses in third quarter will slow any inventory buildup.

Main warehouse inventory difficulties are in structurals, hot and cold-rolled sheet, cold-finished bars and forging rounds in the larger sizes, and light plate. The last item has reversed itself completely. A few months ago, light plate was beginning to accumulate. Currently, plate below 1 in. is getting tighter, heavy plate is beginning to ease and even pile up in some cases.

Sheets are particularly difficult. One warehouse that has been purchasing cold-rolled sheet from converters will be cut even at this source. Converters can't get hot-rolled material, and must cut their cold rolled deliveries accordingly.

Similarly, while some slabs are available, it's difficult to have them reheated and hot-rolled. Alloy steels are another tough problem.

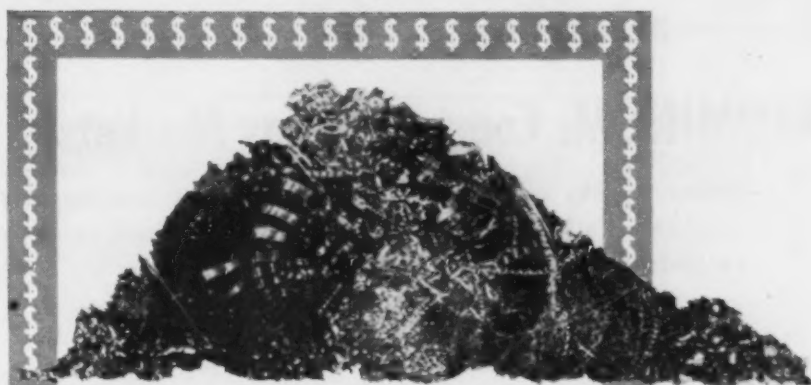
### Galvanized Demand Dips

On a few items inventories are beginning at last to show promise. Heavy plate in one warehouse was at 90 pct of normal inventory. Another ran about 80 pct. One warehouse reports no inventory difficulties whatsoever in hot-rolled sheet.

Galvanized is in good supply, chiefly due to a lag in demand from farms and sheet forming shops. Cold-finished bar under 1 in. is in good supply, and even a drug in one or two cases. Specialty items like floor plate and expanded metal pose no difficulties.

Currently, warehouse business levels are excellent. A slight slump at the end of second quarter seems to have been recovered, and most warehousemen indicate they could sell considerably more steel if they had it to sell.

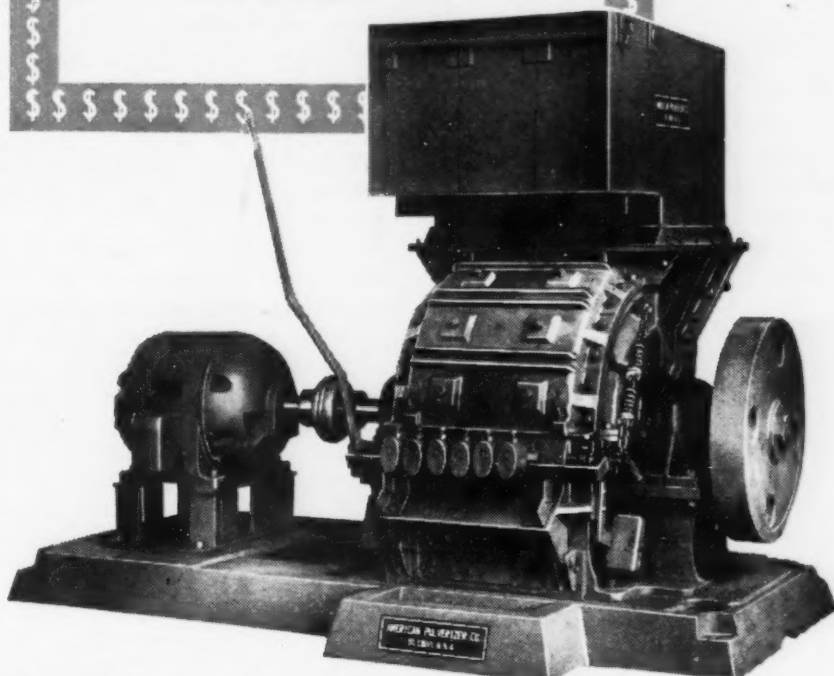
But unless mill demand slackens considerably with third quarter cancellations, they'll be getting less steel to sell.



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# ALUMINUM: Courts Oil, Gas Markets

**Industry seeks new outlets . . . Much of its new capacity neighbors Gulf Coast oil, gas fields . . . Light weight, corrosion resistance prove valuable—By R. L. Hatschek.**

With a quarter of its productive capacity in the immediate Gulf Coast area, the aluminum industry is actively seeking "home" markets for the light metal. A natural target is the oil and gas industry—a big, still growing metal consumer ideally located for Texas and Louisiana aluminum producers.

Outlook is that there won't be any lack of regular customers for quite some time. But for an industry that's more than doubling pre-Korea capacity, advance planning to assure future markets and growth is needed.

## Light Weight Helps

Believing the oil industry will soon be a major aluminum consumer, Reynolds Metals Co., for instance, is currently doing development work with 20 different oil companies.

When you think of gas or oil, you think of pipelines. And this is one of the jobs aluminum is try-

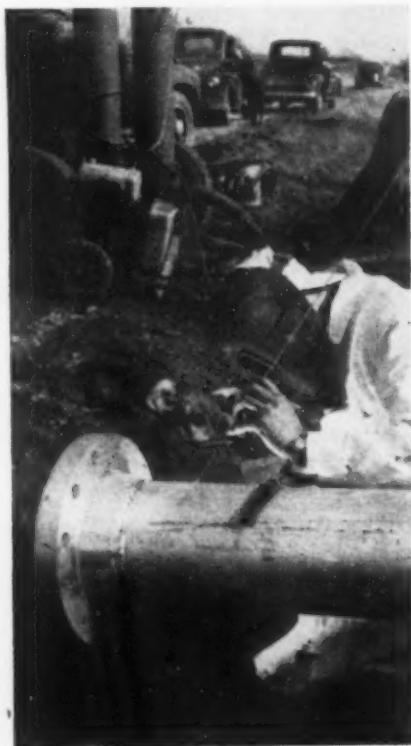
ing out for—but not the only one. Other aluminum products that may make the grade include: Sucker rods, storage tank decks, heat exchanger tubes, tubing for instrument lines, sheathing and jacketing, foil wrapping for samples, and even some structural products.

Light weight and good corrosion resistance are aluminum's prime advantages. Both aid in cutting costs to the point where more expensive aluminum can compete with cheaper materials.

Illustrating the good performance and economies possible with aluminum pipelines is a test installation made by Alabama-Tennessee Natural Gas Co. The line was protected in the conventional manner by cleaning, priming, painting and wrapping. One 40-ft section was left bare with a bypass around it so that it could be dug up and inspected at intervals.

Inspection 17 months later showed no discoloration or corrosion inside or outside the bare section, according to Reynolds. After 25 months the joint between the aluminum and the steel pipelines was inspected. The aluminum flange had not been wrapped but it had been insulated to prevent a galvanic couple with the steel. Again Reynolds reported no evidence of corrosion.

**LIGHT WEIGHT** of aluminum helps in positioning for down-hand welding (left) and moving pipe. Two men can carry a 40-ft length of 8 1/8-in. pipe (below).



Both time and money are saved in installing aluminum lines because of the metal's light weight. Shipping is cheaper. Sections are easier to roll for down-hand welding of longer sections. Fewer men are needed to lower the lengths into position. Lighter river crossings are possible. And the need for corrosion protection is reduced in many cases.

Aluminum's lightness also enables some rigs to become more mobile. Laws in some states forbid some of the heavy equipment to use state roads. Reynolds cites the case of a \$60,000 structure in which aluminum saved 15,000 lb at a cost increase of only 5 pct.

## Has Many Uses

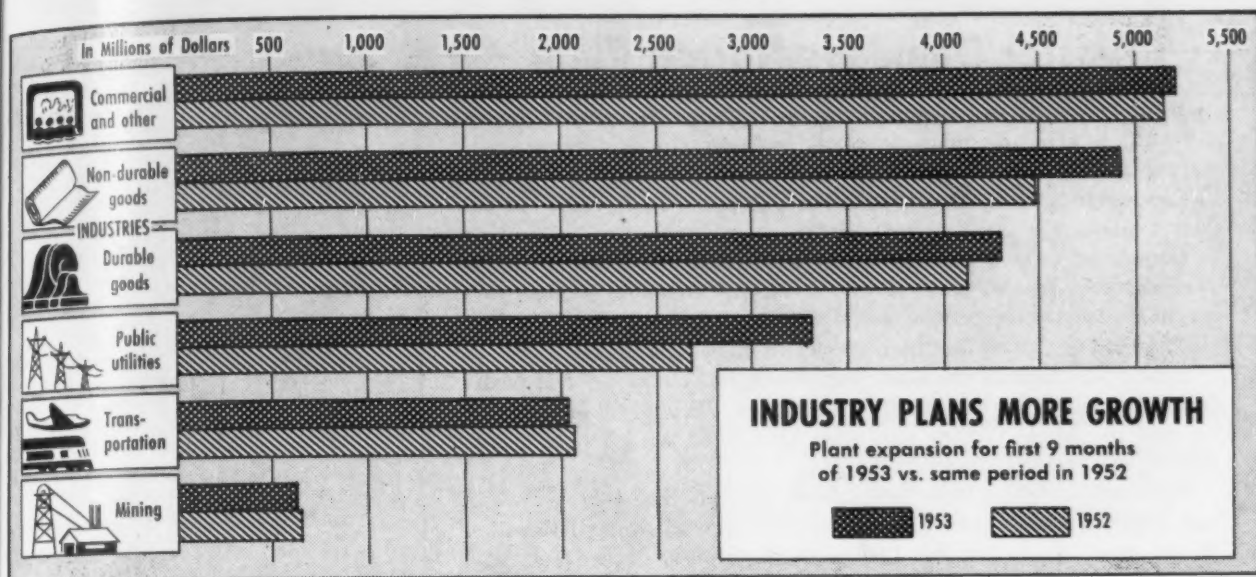
Roof decks of storage tanks in sour crude areas are a natural for aluminum because of its resistance to attack by hydrogen sulfide. The gas tends to collect under the deck, combining with moisture to form a highly corrosive atmosphere. But aluminum decks installed in 1928 have stood up well and look as if they'll continue to do so.

In some cases aluminum performs equally as well as the usual material but it costs less. Instrument lines and heat exchanger tubing fall into this category.

Even foil has special oil and gas applications. Jacketing of processing lines to give weather protection and prevent water absorption by the insulation is one use. Another possibility is polyethylene-coated "oil foil" which is under test as a sheathing material for pipe. A good wrapping or container to retain the volatile content of core drill samples has long been sought. Heavy foil now looks like the answer.



## Expansion



## TRUCE TALKS: Don't Slow Expansion

**Capital expenditures by industry and business expected to hit all-time high of \$28 billion . . . Iron, steel outlay ahead of last year . . . Automakers hold their own.**

Indications are that increasing chances for a Korean truce are not causing business and industry to change their plans on expansion of plants and equipment.

Expansion of some basic industries is being rounded out, will go slowly from here. But reports to the government indicate that private enterprise will reach an all-time high in capital expenditures during 1953.

At the present pace, such expenditures are running 7 pct above last year. This will slow down later in the year for seasonal and other reasons.

### Heavy Construction Outlay

But the latest government analysis and survey, made since truce talks became concrete, indicate outlays for facilities during 1953 are likely to reach \$28 billion, well above last year's record expenditure of \$26.5 billion.

This does not seem too far-fetched in view of estimates that \$6 billion alone will go into construction of new factories, warehouses, stores, garages and other similar projects—not counting outlays for equipment.

Contrary to earlier expectations, government reports show that capital expenditures by the iron and steel industry are running slightly ahead of last year, despite rounding off of expansion. Third quarter outlay will exceed last year's.

### Automakers Hold Own

Similarly, first half expenditures by primary nonferrous metals industries have stayed ahead of last year and will continue to do so. The same holds true of metal fabricating industries.

Manufacturers of motor vehicles and parts, however, have just about held their own. Reports to the Commerce Dept. and Securities & Exchange Commission are not sufficiently complete to use, which indicates industry indecision.

The latest survey by the two agencies, made in late May, shows that the biggest boom will come in the public utilities field.

Some \$2.1 billion was spent during first half. Another \$1.2 billion is slated for the third quarter. This means that capital outlay for the 9 months would be running 20 pct ahead of last year.

Outlay by the oil and coal products industry last year totaled roughly \$2.6 billion. Total for 1953 can be expected to hit \$2.8 billion or more as the oil industry tries to set a new record of 10,000 miles of new pipeline laid.

### How Much Spending

Third quarter capital expenditures as seen by SEC and Commerce Dept. for major industries, are (in millions of dollars):

Steel, \$350; primary nonferrous metals, \$140; fabricated metal products, \$105; electrical machinery, equipment, \$120; machinery other than electrical, \$230; railroads, \$330; public utilities, \$1200; transportation, \$680; and mining, \$225.

### Defense Buys Fighting Hardware

In the 10 months ending Apr. 30, the defense establishment obligated \$26.9 billion for major equipment, military building, and plant expansion. Of this, \$4 of every \$5 went into the fighting hardware department. Actual amount was \$21.9 billion.

Obligations for military construction totaled \$2.1 billion and for clothing, food, and fuel, \$2.9 billion, in the same months.

A breakdown shows the Air Force obligated \$13.1 billion, the Army \$6.8 billion, and the Navy \$6.9 billion. The other \$100 million was accounted for by interdepartmental construction.



## Twister Damages Norton Plant

Built to withstand enemy bombing attack, Norton Co.'s new \$6 million grinding machine plant suffered storm damage estimated at over \$1 million in the 10-minute tornado which struck Worcester last week. But production was back to 80 pct of normal last Friday.

Completed only 6 months ago, the steel and concrete building was directly in the path of the twister. Damage was limited primarily to the structure itself. Steel roof decking was ripped off, carried as far as Dedham, Mass., 35 miles away.

Siding was torn off the steel framework, but the structural members themselves were virtually undamaged. Windows were blown in, and the whole factory and office area filled with broken glass, debris, and water from broken pipes.

Castings weighing tons were spun around like tops. Papers and records were reported found as far away as Boston, 40 miles to the east. It is not yet known how seriously record loss will affect operations.

Fortunately no one at the plant was killed, but eight employees were injured, some seriously. Casualties would have been worse, Norton officials say, if employees hadn't thought quickly, taken shelter under desks and machines. Three employees died and over 30 were injured in other parts of the city.

The tornado struck at 5:30 in the afternoon. Four hundred office workers had been dismissed for the day, but heavy rains just before the blow had kept many of them waiting inside the office, under shelter. The second shift of 300 plant workers had reported 2 hours earlier to the shop.

The storm passed across the north end of the Norton area and missed the main plant. If it had struck a few minutes later it would have caught the second shift at supper in the cafeteria, which was virtually demolished.

Repairs were underway in a few hours, with men, equipment, and supplies rushed in from as far away as Buffalo. Construction workers started arriving at the plant within 3 hours after the storm.

Norton has set up a disaster bureau to give personal and financial aid to all employees, active or retired, and their families.



## Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Supercharger drive shaft, 117 ea, \$61,144, Alresearch Mfg. Co., Los Angeles, *James B. Meyer*.  
 Voltmeter, 189 ea, \$77,585, Millivac Instrument Corp., Schenectady.  
 Pump assys, 683 ea, \$78,903, Eastern Industries, Inc., New Haven, Conn.  
 Actuators for F2H-3 aircraft, 94 ea, \$118,265, Foote Bros. Gear & Machine Corp., Chicago.  
 Mount assy for aircraft, 5625 ea, \$497,278, The M. D. Mfg. Co., Inc., New Haven, Conn.  
 Spare parts for P & W engines, var, \$59,687, Holley Carburetor Co., Detroit, N. *Dann*.  
 Indicators, transmitters, var, \$75,720, The Liquidometer Co., Long Island City, N. Y.  
 Alternator, 161 ea, \$172,171, Bendix Aviation Corp., Easton, N. J.  
 Actuator, 64 ea, \$90,793, Foote Bros. Gear & Machine Corp., Chicago.  
 Spare parts for P & W aircraft, var, \$283,685, Holley Carburetor Co., Detroit, N. *Dann*.  
 Indicators, var, \$253,861, Sperry Gyroscope Co., Great Neck, N. Y., *George A. Dennis*.  
 Spare parts for P & W engines, var, \$6,961,489, United Aircraft Corp., East Hartford, Conn., *E. E. Champion*.  
 Parts to be used on P & W aircraft engines, var, \$119,519, United Aircraft Corp., East Hartford, Conn., *E. E. Champion*.  
 Spare parts for P & W engines, var, \$262,400, United Aircraft Corp., East Hartford, Conn., *E. E. Champion*.  
 Signal generator, 102 ea, \$200,736, Hewlett Packard Co., Palo Alto, Calif.  
 Spares to support shaft, actuator, screw-jack, var, \$92,381, Lear, Inc., Grand Rapids.  
 Pumps, 10, \$71,550, Waterbury Tool Co., Waterbury Conn.  
 Positive displacement, internal compression, scavenging blower, 4, \$113,118, General Motors Corp., Cleveland, A. O. *Cash*.  
 Pump, distiller circulating, 48, \$61,136, Economy Pumps, Inc., Philadelphia.  
 Centrifugal fan, 109, \$62,309, Buffalo Forge Co., Washington.  
 Burner, oil, stove, 25000 ea, \$449,250, American Gas Mach. Co., Albert Lea, Minn.  
 Burner, oil, stove, 31220 ea, \$588,965, Longeran Mfg. Co., Albion, Mich.  
 Washer, laundry, 12 ea, \$63,414, A. A. Laundry Mach. Co., Chicago.  
 Laundry and dry cleaning eqpt, 12 ea, \$75,457, The American Laundry Mach. Co., Chicago.  
 Machine, mixing, 150 ea, \$129,300, The Triumph Mfg. Co., Cincinnati.  
 Cutlery, 152296 ea, \$61,690, Russell Harrington Cutlery Co., Southbridge, Mass.  
 Ice cream plant, 40 ea, \$62,320, Emery Thompson Mach. & Supply Co., New York.  
 Table, steam, 762 ea, \$224,482, Star Metal Mfg. Co., Philadelphia.  
 Desk, office, steel, 1628 ea, \$126,902, Joseph Turk Mfg. Co., Bradley, Ill.  
 Burner, oil, stove, 42000 ea, \$634,200, Taylor Metal Prod. Co., Mansfield, Ohio.  
 Burner, oil, stove, 3600 ea, \$56,197, Breese Burners, Inc., Santa Fe, N. M.  
 Pots, stock w/cover, 6799 ea, \$165,696, The Aluminum Cooking Utillties Co., Inc., New Kensington, Pa.  
 Alignment gages for inspection purposes, 17, \$76,500, Riverside Tool & Engr. Co., Inc., Mishawaka, Ind.  
 Replenishment of small arms parts, 2000, \$72,000, Rett Products Co., Detroit.  
 Replenishment of combat vehicle parts, 53-1012, 4000, \$327,750, Albert-Harris, Inc., Akron.  
 Replenishment of combat vehicle parts, 53-1353, 39000, \$197,467, Electric Auto-Life Co., Toledo.  
 Replenishment of combat vehicle parts, 25000, \$142,075, American Generator & Armature Co., Chicago.  
 Replenishment of combat vehicle parts, neg, 16000, \$2,508,800, Firestone Tire & Rubber Co., Akron, C. D. *Smith*.  
 Booster, 1150000 ea, \$1,028,100, Albert Wright, Emeryville, Calif.  
 Repair parts, 50 items, \$65,662, York Corp., Los Angeles.



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without a defect!

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## Industrial Briefs

**Big Move . . .** U. S. PIPE & FOUNDRY CO. will start moving its main office from Burlington, N. J. to Birmingham, Ala. next month.

**Next Week . . .** PETER A. FRASSE & CO., INC., is opening a new plant at 1275 Sheridan Drive, Tonawanda, N. Y. on June 25.

**Sales Outlet . . .** BASIC REFRACTORIES INC., Cleveland, has opened a new sales office in St. Louis with J. P. Holt in charge.

**New Home . . .** NATIONAL STEEL TREATING CORP., has moved to 14548 Joy Road, Detroit.

**West Coast Office . . .** L. B. FOSTER CO., has established a new office at 3460 Wilshire Blvd., Suite 606, Los Angeles. Henry E. Fleishman will be in charge.

**Annual Course . . .** THE PENNSYLVANIA STATE COLLEGE will hold its 15th Annual Motor Fleet Supervisor Training Course on Sept. 14-18, to be conducted by the Institute of Public Safety.

**In Business . . .** NEUMANN & WELCHMAN, is a new firm at 37 Wall Street, which is a partnership consisting of Charles E. Neumann and Charles G. Welchman. They'll furnish the needs of American industry for alloy and stainless steels in the forms of ingots, slabs, billets, castings etc.

**New Service . . .** A new engineering consulting service of KAISER ENGINEERS will be started by Ray Fullerton in Pittsburgh as the latest step in broadening national engineering and construction activities.

**Helping Hands . . .** CONTINENTAL CAN CO., New York, and C. A. Swanson & Sons, Omaha, Neb., are donating a carload of 48,000 cans of chicken broth for relief of refugee children in Free Berlin.

**Joins Staff . . .** A. L. Small, has joined the engineering staff of the AMERICAN INSTITUTE OF STEEL CONSTRUCTION, New York.

**Hear Ye . . .** AMERICAN BRAKE SHOE CO., New York, declared a quarterly dividend of 75¢ a share on the common stock, payable June 30.

**Congratulations . . .** Carl A. Odensing, Superintendent, Columbia, Tenn., plant of National Carbon Co., a division of UNION CARBIDE & CARBON CORP., has been awarded an Alfred P. Sloan Fellowship under the Executive Development Program at Massachusetts Institute of Technology.

**Four-In-One . . .** Bendix-Skinner Div., BENDIX AVIATION CORP., is constructing a new plant to consolidate four smaller Detroit facilities into a single production unit.

**Blood Bank . . .** MESTA MACHINE CO. employees have entered the "banking business" with the establishment of an employee blood donor bank. \*

**Addition . . .** NATIONAL AUTOMOTIVE FIBRES, INC., reports a further expansion of manufacturing facilities in Canada by the construction of an addition to its nearly-completed new plant at Ajax, near Toronto, Ont., for its subsidiary, Canadian Automotive Trim, Ltd.

**Increase Capacity . . .** Edison Storage Battery Div., THOMAS A. EDISON, INC., reports that a major factor leading to new plans for plant expansion and increased production of batteries is rapidly increasing demand for Edison nickel-iron-alkaline storage batteries for powering electric industrial trucks used in material handling.

**Receives Order . . .** ACF-BRILL MOTORS CO., Philadelphia will build a number of custom-designed trailers to house specialized Air Force electronic equipment. Order was received from the Federal Telephone & Radio Corp., Clifton, N. J.

**Seattle Office . . .** A. MILNE & CO., New York, has a new sales office at White Henry Stuart Bldg., Seattle.

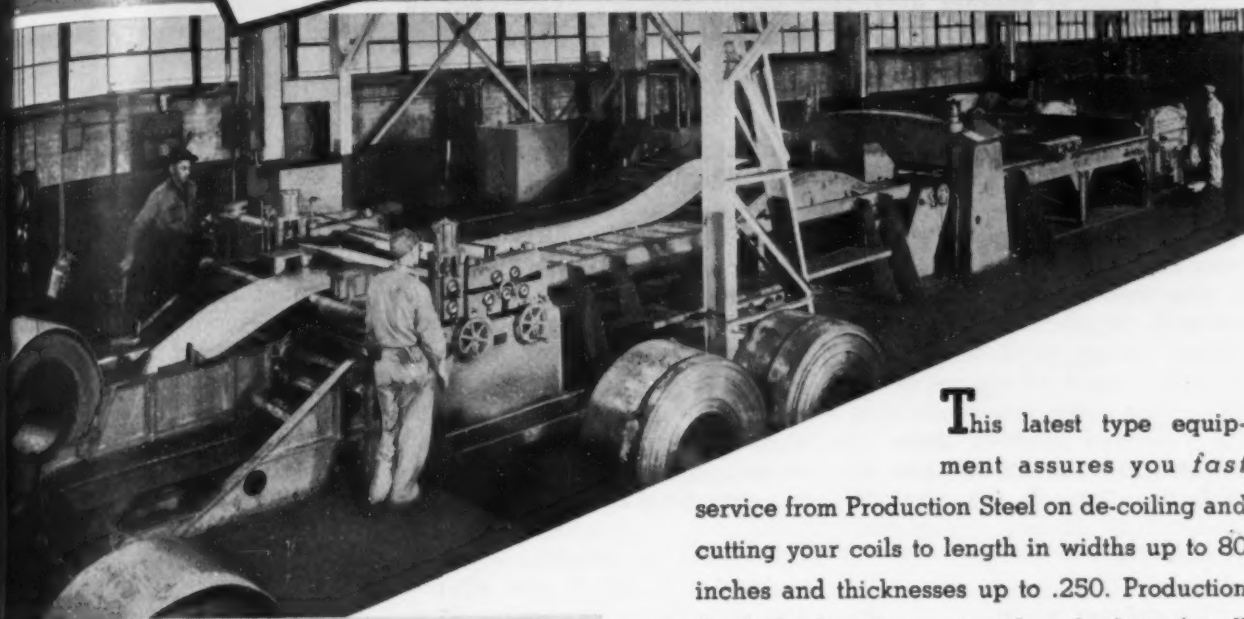
**Starting Soon . . .** MCINNES STEEL CO., Corry, Pa. reports that construction is scheduled to start soon on a plant addition which will cost \$150,000.

**Adds to Line . . .** RAYBESTOS-MANHATTAN, INC., Manhattan Rubber Div., Passaic, N. J. has added Manhattan Metal Bonded Diamond Wheels, in certain types, to its line of diamond wheels.



# Production Steel's Newest Modern **ROLL and CUT LINE**

Converts Coils to Sheets  
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electronically operated, gives this 4-high, reversing type cold strip mill unusual flexibility in supplying cold rolled steel strip to your **EXACT SPECIFICATIONS**. Thicknesses .025 to .125 in all tempers, and in either bright or satin finish, are processed to your exact width in coil or cut lengths. Tempers ranging from dead soft to full hard, controlled by annealing and skin passing.

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W. J. Knoll, Sales Representative

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Phone: 73-5722  
Dean Hethington, Sales Representative

SENECA STEEL SERVICE, INC.  
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Phone: 5759  
S. N. Olmsted, Jr., Sales Representative

PRODUCTION STEEL COMPANY  
1040 High View Lane, Green Bay, Wisc.  
Phone: HOWard 7407  
Tony Canadeo, Sales Representative



# The Automotive Assembly Line

## High Auto Output Worries Bankers

**American Bankers Assn. feels automakers are overproducing at present price levels . . . Predicts used car sales trouble . . . Some dealers pick up own paper—By R. D. Raddant.**

Are automakers whistling in the dark? They continue to schedule maximum production, optimistically predict fat sales through the remainder of the year, and hope in some cases to make all-time unit and sales records.

Most recent word of warning that they might be overextending themselves came last week from the American Bankers Assn. It warned that the annual rate of production "exceeds the market's potential to absorb at existing price levels."

"Headed for Trouble" . . . In particular the ABA singled out the used car market which, it predicts, "looks as though it is headed for trouble."

Upshot was a warning to bankers not to maintain or increase their present outstandings by low-

ering any standards on installment buying either in terms or policies.

Many dealers, particularly in the used car market, already blame bankers for too tough policies that are hindering their sales. They complain that many eager buyers are being turned away by credit terms that are too steep to meet.

Some dealers are picking up their own papers, believing that banks and loan agencies are turning down good risks.

**Discount Warnings . . .** The bankers' warning is one of the first real arguments that has been picked with the optimistic auto industry. Steelmakers have implied that the market was not so strong as Detroit thinks. Dealers have been complaining for some time about a tough sales picture and low profits for unit sales.



THREE PHASE WELDING has replaced conventional riveting in steel wheel production at Motor Wheel Corp., Lansing, Mich. A significant change in manufacturing methods, its advantages are stronger wheels and 50 pct less floor space.

These have been discounted here as traditionally pessimistic viewpoints.

No immediate reaction could be obtained from high ranking automotive executives on the ABA warning.

But, General Motors, for example, has a June 5 speech by Harlow H. Curtice that must be considered the corporation's official feeling.

**Biggest Dollar Year . . .** "We believe that 1953 will be one of our best production and sales years," Mr. Curtice said. "Results for our first quarter established new records for total dollar sales and employment. . . . Not only will 1953 be one of our best years in GM from the standpoint of physical volume, as measured in automotive units, but it will be our biggest year dollarwise."

Nevertheless, among the independents it is frequently rumored that the present Borg-Warner strike which has held volume down has been a welcome excuse. Some of them, while they would never admit it, are glad for the opportunity to cut dealers stocks without having to admit a production cut-back.

**New Wheel Deal . . .** An average driver doesn't know and probably doesn't care how his car's wheel is put together. Whether the disc is welded or riveted to the rim makes little difference as long as it holds together.

But at Motor Wheel Corp. in Lansing, Mich., three phase welded wheels have largely replaced the riveted variety which went unchallenged for many years as the only practical way to make a steel wheel.

**More for Less . . .** It does make a difference. To the company it means a 50 pct saving of space in the wheel assembly department. To the driver it means a stronger wheel.

Wheels welded by the three phase process called Electrofuse



can withstand an impact test in which a 500 lb steel weight is dropped 96 in. The rim will bend under the impact, but welds hold securely.

Until the Electrofuse process was used on wheels, there was considerable coolness in the auto industry to welded wheels. Spot welds were considered inadequate for the stresses and strains of a wheel and welding in general was not encouraged.

Motor Wheel, a major supplier of auto and agricultural wheels, began research on welding in 1945. Wheel manufacturers consider the introduction of the welding process the first major change in wheel manufacturing since the steel wheel was introduced.

**One Left . . .** One assembly line in which wheels are riveted remains at Motor Wheel, creating a striking contrast in manufacturing technique. In the riveted line, rims and discs are fastened together with rivets, each inserted and peened by hand before they are riveted mechanically.

In contrast, the welded wheel line is fully automatic requiring only one lift and one indexing. Eight welds are used, two to a spoke, replacing 12 hand-inserted rivets. The welding operation, which one man handles, cuts the length of a wheel line in half, eliminates numerous handling jobs, and has cut salvage 50 pct.

M. F. Cotes, Motor Wheel president, reports the Electrofuse process has welded more than 5 million wheels without a failure. In addition to increasing car passenger safety, Mr. Cotes points out that welded wheels are meeting demand for increased strength in agricultural and industrial vehicles.

Process is an electronically controlled three phase resistor method of welding in which the discs are fused to the wheel rims, forming an integral assembly. Welded areas are actually stronger than the parent metal. In Motor Wheel's process, the weld is the strongest part of the wheel.

The company has invested \$750,000 in the changeover.

## Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
June 13, 1953 . . .	147,064*	19,985*
June 6, 1953 . . .	117,463	17,208
June 14, 1952 . . .	102,452	28,122
June 7, 1952 . . .	100,290	28,658

\*Estimated Source: Ward's Reports

## Toolbuilders Hedge Against Slump

Machine tool builders in the automotive capital are enjoying some of their best months in spite of bearish indications elsewhere in the machine tool business.

But even some of the most successful are making plans to ease the effects of a potential slump.

Micromatic Hone Corp. of Detroit has increased its backlog from \$3 million to \$5 million in the past year. But last week entered into a diversification to provide, as the company puts it, "insurance when the inevitable valleys appear on the machine tool graph."

The company acquired the Diesel Engineering and Manufac-

turing Corp. of Chicago, a manufacturer of injection equipment for diesel engines and precision parts for hydraulic controls for jet aircraft.

## Twisters Spare GM Auto Plants

Michigan's workers have become tornado conscious. At least three separate twisters in 1 day last week hit the heavily populated southeast part of the state killing more than 100 persons and doing more than \$10 million property damage.

Biggest damage was in the Flint area where General Motors employs 68,000 persons in Fisher Body, Buick, Chevrolet and AC Sparkplug divisions.

The Flint tornado snuffed out more than 100 lives, but missed industrial areas. Some Chevrolet plants were closed the day following the tornado, but only because of a power failure. Assembly operations were not affected. GM immediately granted \$100,000 for disaster relief.

## THE BULL OF THE WOODS

By J. R. Williams

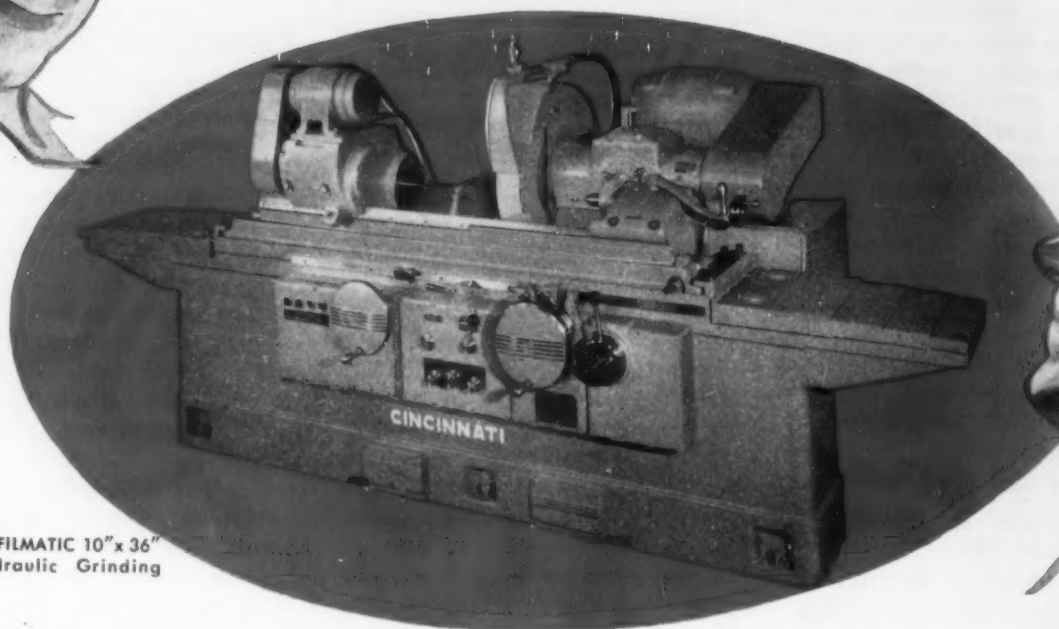






# Any Way You Look at it . . .

## OPERATORS PREFER CINCINNATI FILMATIC PLAIN HYDRAULIC GRINDERS

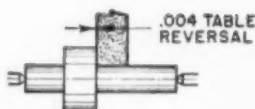


CINCINNATI FILMATIC 10" x 36"  
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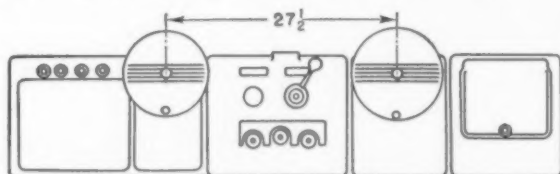
Give the operator a machine he likes to run, and you'll find that high quality and low cost go hand-in-hand. In the field of precision centertype grinding, operator preference is for CINCINNATI FILMATIC Plain Hydraulic Grinders. They're dependably accurate, easy to operate; they remove metal rapidly. A few advantages of CINCINNATI FILMATICS are illustrated here.



Two-speed manual table traverse; for convenience in setting up the machine.



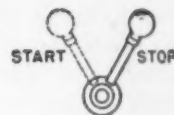
Accuracy of table reversal .004"; for safely grinding close to shoulders.



Convenient arrangement of controls for comfortable, efficient operation.



Grinding wheel spindle bearings are FILMATICS. They are dependable—require no adjustment for any type of finish.



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## This Week in Washington

### NPA Paperwork Will Ease—Won't End

**Who must continue to fill out reports . . . Reduce forms to less than six . . . Plan public works program as pump primer . . . Renegotiation law may expire—By G. H. Baker.**

End of National Production Authority will ease—but not end—the paper work and filling out of government forms by the steel industry.

Any company having military or atomic energy orders for one or more of 16 carbon and four alloy steel products will have to continue reporting shipments, perhaps file other data.

Generally speaking, it is estimated that about one-third of the steel industry will be out from under paper work. These will be smaller companies holding no A to E orders, and those not getting production directives.

From 16 to 6 . . . At one time, NPA was requiring steel mills and foundries to submit up to 16 completed forms and reports. Officials say that by the beginning of the fourth quarter this figure will have been cut down to less than half a dozen.

A report which up till now has been required from foundries on production of castings will, beginning July 1, go over from a monthly to quarterly basis and also be on an A to E basis.

Revision is in store for NPAF-114, on which applications for allocations of alloying materials are submitted by melters and processors. It will apply to July production.

If it works out the way it is now planned, officials estimate that by September NPA can throw out forms 60 and 102. These are reporting forms for scheduled uses of alloying materials and are required of melters and processors of alloying materials.

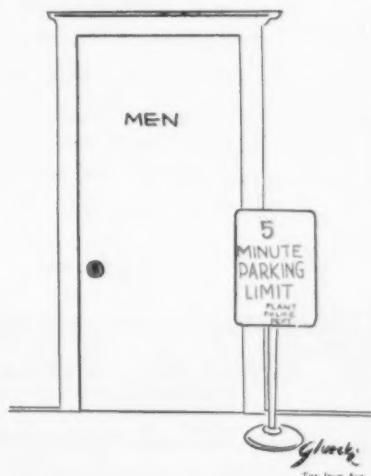
**Program for Trouble . . .** Top-level Administration officials are

drafting the outline of a nationwide public works program. Although no appreciable drop in either the manufacturing or distributing trade is anticipated, the White House believes it is wise to have a pump-priming program ready—just in case.

Details of the program probably won't become available until this autumn. But it is known that the anti-deflation program includes at least two points of interest to business—lower taxes and easier credit.

**Renegotiation Expires? . . .** Administration officials have decided against asking Congress to extend the renegotiation law. Lack of any strong sentiment on Capitol Hill for an extension points to expiration of the statute on Dec. 31, 1953.

But expiration of the law (technically known as the "Renegotiation Act of 1951") shouldn't be construed by defense producers as a signal to forget any renegotiation proceedings to which they are liable. Far from it. The Renegotiation Board has full authority to continue its legal proceedings until mid-1956.



All defense contractors and subcontractors holding contracts in excess of \$250,000, as well as brokers and agents holding contracts valued at more than \$25,000, are subject to provisions of the law.

**Protect Small Firms . . .** Representatives of rubber-consuming industries, including firms in the wire and cable, paint, and mechanical goods fields, are urging Congress to safeguard the interests of small business in disposing of the Federal Government's huge synthetic rubber business.

Their recommendations are being presented to the House Armed Services Committee, now holding hearings on President Eisenhower's proposal that the government sell the war-time synthetic plants it now leases to private concerns.

Independent rubber users fear they will be squeezed out of the market for lack of supplies if the synthetic industry falls into the hands of the largest rubber manufacturing firms. They want Congress to channel most of the GR-S (synthetic) plants away from the Big Four producers or to non-rubber goods manufacturers.

**Won't Lower Draft . . .** Cutbacks in military manpower drafts resulting from the Korean negotiations are not expected to be appreciable.

Secretary of Defense Charles E. Wilson says the military services could use about 1 million new men each year for the next several years. But he concedes that there are not that many men available, nor will there be.

**Wheat Storage . . .** Agriculture Dept. has contracted for 300 grain ventilating units and 700 perforated extension tubes from the Columbian Steel Tank Co. of Kansas City.

Delivery will be to Baltimore and Norfolk, for use in the department's expanding program of wheat storage in the holds of reserve fleet vessels.





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# PEACE: Business Will Stay Good

Post-Korea recession fears groundless, government economists find . . . Defense spending to stay high in fiscal '54 at almost \$43.2 billion . . . Budget slashes doubtful.

Substantial production, distribution, and sales opportunities in the next half-year are forecast by federal officials watching Korean truce moves.

End of actual shooting, they believe, will not dampen industrial expansion, construction or merchandising, despite some publicly-expressed recession fears. They see heavy orders, ample money for finished goods, and cagey but continuing buyer interest.

## Defense Spending High

Basis for this outlook is expected high defense spending in fiscal 1954. Unless Congress makes improbable slashes in the Defense Dept. budget, the fiscal year will begin July 1 with greater military dollar obligations than in the early months of fiscal 1953.

The Pentagon estimates that obligations for all purposes by all branches of the armed forces in the coming July-Sept. quarter will total \$11.395 billion. This contrasts with slightly less than \$10 billion for the same months of fiscal 1953.

## Start Scaling Down

Gradual scaling down is scheduled to start in second quarter, continue thereafter. Proposed second quarter obligations are \$10.919 billion against last year's second quarter total of \$10.941 billion.

Quarterly obligations are expected to slide gradually down to a last quarter figure of \$10.364 billion. But even with this drop the fiscal 1954 total is being figured at just under \$43.2 billion.

With these figures and earlier records in mind, government economists find the nation's economic structure well braced against possible recession. They expect businessmen, whose new investment for plant and equipment in the second quarter is above that of the

first, to make even greater outlays in the 3 months beginning July 1.

## Expect More Investment

Following a very recent survey, one agency reported that business will invest about \$7.1 billion in the next quarter (July-Sept.), thus getting off to a possible record year for private investment in production facilities. Capital expendi-

## Trends In Defense Spending

Fiscal 1953	Fiscal 1954
Obligated	Projected
<b>\$ 9.999</b>	<b>\$11.395</b>
First Quarter	
<b>\$10.941</b>	<b>\$10.919</b>
Second Quarter	
<b>\$10.647</b>	<b>\$10.512</b>
Third Quarter	
Incomplete Fourth Quarter	<b>\$10.364</b>
(April total was \$3.832)	

tures, the report says, may total \$20.5 billion for the Jan.-Sept. period.

Earlier estimates of a \$27 billion year for business investment are probably now outmoded. Total expenditures for new plant and equipment in 1952 were \$26.455 billion.

Manufacturers of planes and components now have Air Force assurance of an order backlog for 2½ to 3 years' production. Prototype projects will continue to prevent any backsliding in the equipment field.

## Future Looks Good

Inventories in most lines are in good balance. Some consumer durables—refrigerators, washers and driers, television sets—are more heavily stocked than in the pre-1953 period, but sales may begin to overtake these inventories after

the summer vacation interval.

Industrial prices are very stable, indicating a good supply-demand relationship. Gross national product is still rising, and unemployment is low at 1.3 million.

Private spending, like industrial spending, is at a high rate. Earners are saving only 8 pct of their disposable income, now climbing above the \$245 billion mark.

## Cancel Training Plane Orders

First cutbacks affecting plane deliveries to the Air Force call for cancellation of orders for 420 T-36 trainers with Beech Aircraft Corp., Wichita, Kan., and Canadair Ltd., of Montreal.

Beech was to build 193 of the piston-engine planes. The firm will complete two T-36's as prototypes for test purposes.

According to the Air Force, the T-36 contracts are being dropped because their jobs "can be handled satisfactorily by other aircraft."

Defense Secretary Charles E. Wilson said recently that cuts in Air Force funds will not mean a reduction in combat plane procurement but will affect the buying of trainers, helicopters, and support planes.

## NPA Considers Moly Decontrol

National Production Authority said last week that it is considering decontrol of molybdenum but again denied that such action is imminent.

International Materials Conference last week announced it would no longer include moly in allocated materials, giving rise to speculation that domestic allocations will also be thrown out.

## Oil Refining Expansion Lags

Expansion of oil refining capacity, on the basis of recent surveys, is running behind earlier estimates but will catch up next year, be ahead of goals in 1955.

Interior Dept. says daily capacity will be 8,100,000 bbl by end of 1953, less than had been expected, but still representing new construction of 400,000 bbl this year.



**SHARONSTEEL**

**reduces  
operating  
costs**

**with 6 thrifty  
BALDWINS**



The use of six continuously operating Baldwin-Westinghouse diesel switching locomotives by the Sharon Steel Corporation at their Roemer Works reduced operating costs. Here is Sharon Steel's report:

● "We have found that operating costs are lower with the Baldwin-Westinghouse diesels than they were with steam locomotives.

"There is a reduction in operating delay at each turn change time, because refueling and resanding is done only once every three days. Formerly, we took on water, coal, sand and cleaned the fires at each turn change.

"The installation of diesel locomotives has been a large step forward in our air purification program. The elimination of smoke and dirt produced by the steam locomotives entering buildings has greatly improved working conditions. Another improved feature over steam locomotives is the ability of the Baldwin diesel to rapidly generate more air pressure for our air dumped cars."

If you are interested in cutting your operating costs, write now for Bulletin DMH-300, to Dept. 1646, Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pa.



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INDUSTRIAL LOCOMOTIVES

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## West Coast Report

### Will Cheap Power Be Short-Circuited?

**Northwest industries fight proposed Bonneville contract revision . . . Plan larger share to private utilities . . . Aluminum on power-sales tightrope—By T. M. Rohan.**

Pacific Northwest industries marshaled their forces last week to prevent a short circuit in their cheap public power lifeline. And with new administration strength behind private utilities, the biggest power controversy in years was brewing.

A week ago, Bonneville Power Administration called in its leading industrial customers to review a proposed new 20-year contract with Portland General Electric. The 40-page proposed pattern would, among other things, give private utilities a considerably larger share of the 1.5 million kw additional capacity coming into Bonneville in the next 5 years.

**Drastic Limitation . . .** Led by Aluminum Co. of America's northwest manager C. S. Thayer, the 12 industries, representing \$500 million investment and 99 pct of BPA direct industrial load, protested last week in a signed statement. Adding fuel to the fire was a Washington column which prompt-

ly drew a scorching rebuttal from Interior Secretary Douglas McKay, in Portland at the time.

The industry statement, backed by firms such as Alcoa, Reynolds, Kaiser, Carborundum Co. and Rayonier, said the proposed contract would set up "drastic limitation" on sale of BPA power for expansions and new industries. It would also "make it virtually certain that new basic industry will be unwilling to establish itself in this area."

Secretary McKay said he felt "all publicly and privately owned utilities served by Bonneville should be restricted from accepting any new customers requiring large individual blocks of power which must be provided by Bonneville. This appears necessary and advisable in view of the shortage of power in the area and the growing needs of all domestic and rural users."

**Aluminum on Tightrope . . .** The proposal puts the aluminum in-

dustry especially on a tightrope. They, of course, want continued cheap power at present levels of about 2 mills per kwhr at 100 pct load factor compared to about 5-9 mills per kwhr from private utilities. But the utilities and Bonneville are both major aluminum customers, principally in cable.

Total Bonneville output for all classes of users now is 1.8 million kw, scheduled to hit 1.9 by the end of 1953. Of the total, industry gets about 698,000 kw but will hit about 1 million with the new Anaconda aluminum plant in Montana, the M. A. Hanna nickel plant and Harvey Aluminum. By 1960, BPA capacity is scheduled to hit 3,560,000 kw at load center.

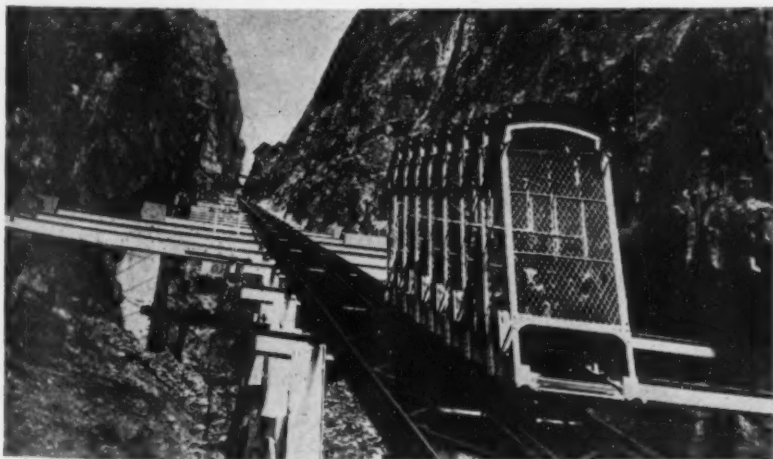
**Forty-Mile Backlog . . .** As California auto production continues to hit new highs, metal parts suppliers' share has grown. This week Chrysler's Los Angeles plant turned out its 1 millionth car—on the only U. S. line producing four makes of autos.

One of the leading suppliers, meanwhile, U. S. Spring & Bumper of Los Angeles, said its sales will hit \$20 million for the fiscal year ending in August. And its highway guard backlog is 40 mi. Dating to 1911, the firm first supplied the Model T bumpers for western plants in 1928, and this year will turn out 1 million bumpers for all western plants.

**Product Mix . . .** Tonnage of finished products for 1953 will hit 60,000, mostly from western steel mills. Besides flat and coil springs and bumpers, these include secondary bars and bumper guards, spring hangars and plates and brake lining.

Non-automotive products include the spring steel highway guards and road dividers, as well as ground tools for farm work.

An 80,000 sq ft expansion two years ago is already outgrown and a 6000 sq ft addition under construction. Heaviest presses used are 1900-ton double acting units.



NEW CABLES have just been fitted to one of the world's steepest railroads at Colorado's Royal Gorge, which descends one-third of a mile at a 45° grade. Cables, made by Colorado Fuel & Iron Corp., are longer than the elevator cables in New York's Empire State Building.



## Machine Tool High Spots

### Raise Expansion Goals \$20 Million

**ODM ups expansion goals for metalworking equipment industries another \$20 million . . . Machine tool production capacity increased by \$7 million—By E. C. Beaudet.**

Recent reviews of prospective requirements have caused the Office of Defense Mobilization to increase expansion goals for metalworking equipment industries another \$20 million above previous targets, with completion dates scheduled for Jan. 1, 1954.

New goals have been set for machine tools, metal cutting tools, miscellaneous metalworking equipment and the dies, jigs and fixture industries. About \$8 million of the \$20 million has already been taken up.

Last January, ODM said no further expansion needs for any of the four industries was then foreseen. It was believed that more than enough tax amortizations applications were on hand to take care of defense requirements.

**Estimate Too Low . . .** However the ODM forecast at that time

seems to have been short of the mark. The latest revision of metalworking expansion goals is to fill in the gap left by earlier estimates. Although the \$20 million expansion figure is but a fraction of the amounts called for at the start of the program, it differs from the others in some respects.

At the start of the amortization program, expansion goals were set up by ODM on the basis of what the government thought would be required. Industries applied for fast tax amortization benefits on their own or were encouraged to do so by the government. In some cases, manufacturers shied away from expansion, not wishing to have too much capacity when the emergency ended.

**Want To Expand . . .** The \$20 million worth of fast amortization

facilities now offered reflects more accurately the desire of certain segments of the metalworking industry to expand to meet current needs. Fast tax writeoff applicants are coming to the government rather than vice versa. These needs were totaled and reached about \$20 million.

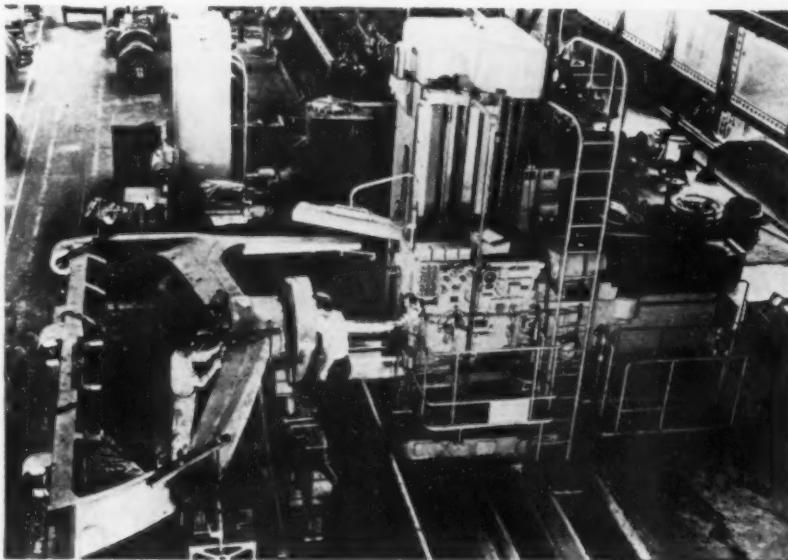
New goal for machine tool production capacity is set at \$138,620,000 in capital investment. As set up in July 1952, it was estimated that \$125 million in new facilities would be sufficient. Last November, this figure was boosted by \$6 million, and now another \$7 million has been added.

The recent increase does not include facilities for expanding production of "elephant" machine tools which are handled under a separate program.

**Request Writeoffs . . .** Although overall machine tool backlogs now average about 8 months, fast tax writeoff requests are coming from builders still quoting long deliveries. Included among these are producers of light milling machines and multiple-spindle screw machines.

Last August, it was figured that producers of miscellaneous metalworking equipment should expand facilities by an additional \$40 million. This was in sight last December, but a review has boosted the target by another \$6,700,000. Major demand is coming from those companies manufacturing heat-treating furnaces and allied equipment, welding apparatus, and foundry equipment.

Similarly, last July the original expansion goal for metal cutting tools was set at \$30 million in new facilities. But need for an additional \$2.5 million in new capacity is seen. Most urgent need is for the expansion of broaching tools to meet requirements of the jet engine program, although other cutting tools are sharing in the requests.



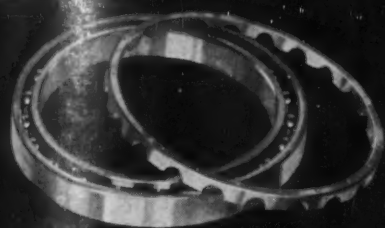
**BORING AND FACING** a skeg casting for an ocean-going freighter on a Giddings & Lewis Series 50 horizontal boring, drilling and milling machine at the Torrance, Calif., plant of The National Supply Co.





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Two 31.000" x 25.000" x 3.500"  
KAYDON Ball Thrust Bearings,  
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and one 20.500" x 15.500" x 2.500"  
KAYDON Annular Ball Bearings  
are used on world's  
largest glass-press.

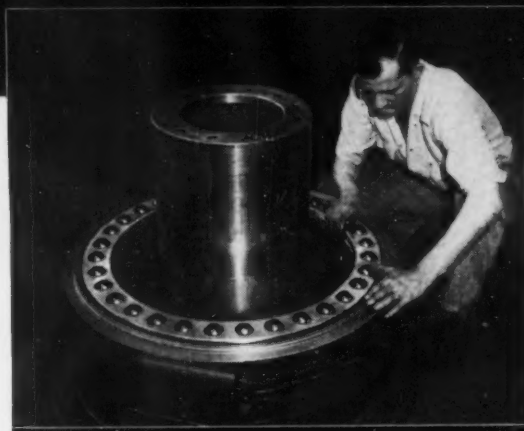


## Where do KAYDON 31-inch bearings fit in T-V sets?

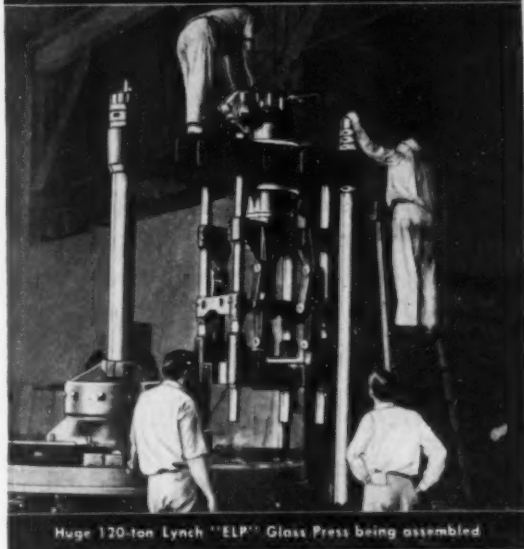
Obviously there's no place for 31-inch bearings in 21-inch T-V sets . . . but four husky KAYDON super-precision bearings are vital factors in producing large T-V tube face-plates (21-inch and up), made on the world's largest glass-press, a product of Lynch Corporation, Anderson, Indiana.

KAYDON bearings were engineered into this huge Lynch "ELP" 120-ton toggle press to support its 5-ton table and to accurately guide the terrific pressure-strokes that form precision T-V face-plates from gobs of molten glass. Now mass production of face-plates is assured with unvarying precision and faultless interchangeability, for dependable T-V reception.

Similarly, KAYDON bearings help designers improve military equipment, aircraft, automotive and many modern heavy-duty industrial machines, to help manufacturers make precision products better, faster, more profitably. On machines you make to sell, or buy to use, specify KAYDON bearings. Capable KAYDON engineers are prepared to cooperate with your technicians. Contact KAYDON.



5-ton table of press rides smoothly on KAYDON bearings



Huge 120-ton Lynch "ELP" Glass Press being assembled

# KAYDON

THE

ENGINEERING CORP.

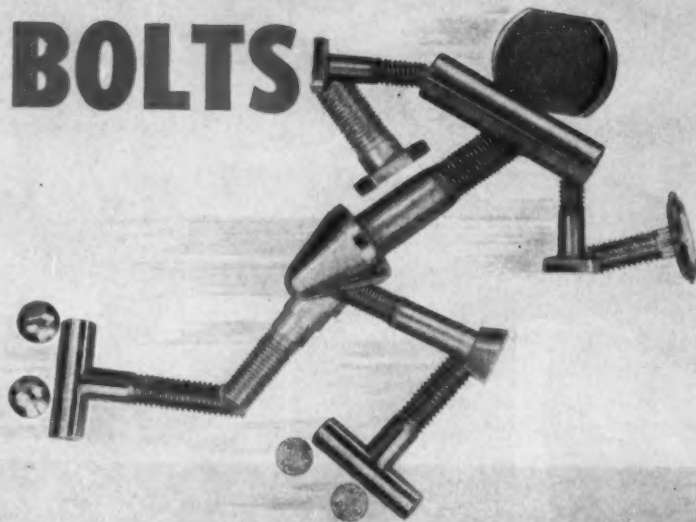
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KAYDON Types of Standard and Special Bearings:  
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## Free Publications

*Continued*

### High speed heating

Surface Combustion Corp.'s bulletin SC-162 points up the advantages of high thermal head heating with gas or oil for press forging, upsetting, extruding, and stress relieving of ferrous and nonferrous metals. Basic furnace designs and burner arrangements are described in conjunction with the demands of overall or selective heating for semiautomatic or fully automatic production. *Surface Combustion Corp.*

For free copy circle No. 15 on postcard, p. 122.

### Aluminum extrusions

*Aluminum Extruded Products* is a booklet featuring a simplified, easy-to-follow section on tolerances of aluminum extruded shapes. Additional information includes a general introduction on aluminum extrusions, a description of the extrusion process, listings of extrusion alloys, nomenclatures and definitions, and material on the characteristics of extruded products. *Revere Copper & Brass Inc.*

For free copy circle No. 16 on postcard, p. 122.

### Electrocleaning

There is a new folder available which explains how Oakite Composition No. 95, an anodic conditioner, removes films and overcomes other obstacles that commonly interfere with successful electroplating on die-cast zinc. Among the advantages claimed for this material are brighter plating and elimination of anodic blackening. *Oakite Products, Inc.*

For free copy circle No. 17 on postcard, p. 122.

### Metal cutting

Notch & Merryweather's Triple-Chip cutting method is said to be equally efficient in cutting off stock and in slitting and slotting. In a new brochure this method of cutting is described. There is also information on the company's saw blades, circular knives and slitters, blade sharpeners and cutting oil. *Notch & Merryweather Machinery Co.*

For free copy circle No. 18 on postcard, p. 122.



**BIG CYLINDERS**

**LITTLE CYLINDERS**

**SPECIAL CYLINDERS**

# **LINDBERG** AIR CYLINDERS HYDRAULIC CYLINDERS

**SHORT CYLINDERS**

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Lindberg's full line of standard air and hydraulic cylinders is backed up by years of experience as "special cylinder specialists."

From coast to coast, you'll find that most of the special cylinder installations . . . the tough jobs that require extra engineering skills and efforts . . . are by Lindberg. In a mid-western sheet and tin mill, you'll see Lindberg Cylinders powering a conveyor system. In a southern aluminum plant, you'll see Lindberg Cylinders on aluminum ingot casting equipment. In an eastern steel plant, you'll see Lindberg Cylinders on large materials handling installations.

From out-of-the-way lumber camps in the north woods . . . to sprawling textile plants in the southeast . . . and busy food processing plants in the west, you'll find that the "special" installations . . . the unusual installations . . . the difficult-to-design installations are by Lindberg.

*We also build a full line of standard cylinders which are just as good!*

*For additional details, ask for bulletin #731, "Lindberg Air Cylinders" and bulletin #701, "Lindberg Hydraulic Cylinders".*

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## **LINDBERG CYLINDERS**

Lindberg Engineering Company  
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# NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 123 or 124.

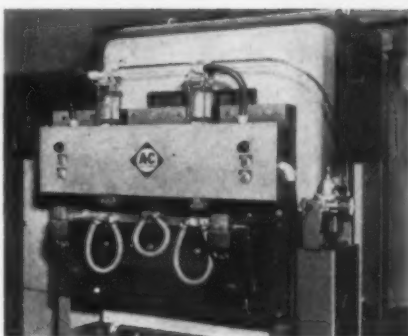


## High speeds feature horizontal broaching machine

Broaching speeds up to 300 fpm, and more, are possible with the La-Pointe electro-mechanical drive broaching machine which has a massive main slide driven by a continuous tooth herringbone bull gear and rack. It is said that the machine produces a better finish while at the same time providing greater accuracy through freer cutting action. Carbide tooth broaches can be

be used at these high speeds. Optional features are dual speed which permits operating the machine at two or more pre-determined speeds for the same broaching stroke; and dual cycle, designed for broaching jet engine components without requiring tool changeovers for the accuracy required. *La-Pointe Machine Tool Co.*

For more data circle No. 19 on postcard, p. 122.

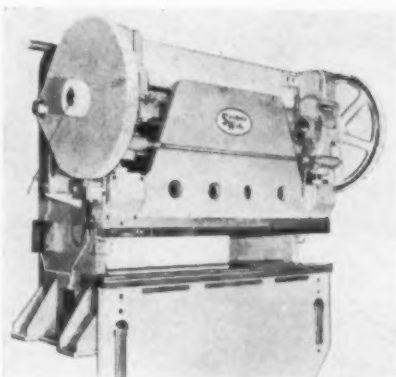


## 100 pct duty cycle possible on induction heaters

New two-station, air-operated, electrically controlled fixture permits the use of two identical or two different work coils on A-C 10 and 20-kw induction heaters. The fixture provides two separate sets of bus bars to which work coils can be connected. While one work coil is supplying thermal energy to metal parts being heated, the op-

erator can unload and reload the other work coil. The same amount of work can be performed with one heater that would normally be done with two installations. The two-station fixture permits a 100 pct duty cycle at full load if the time periods for heating and reloading are equal. *Allis-Chalmers Mfg. Co.*

For more data circle No. 20 on postcard, p. 122.

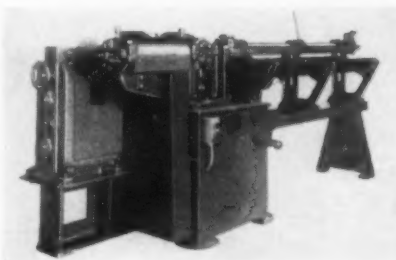


## Press brake forms steel 3/4 in. thick x 8 ft wide

A 400-ton capacity press brake, the Model 400-PB-8, affords the operator complete control at all times with instant stopping of the ram at any point. It is provided with pneumatic clutch and separate brake, operating controls for cycling and inching, plus control for a single work stroke with return of the ram to up position. Force is exerted along the centerline of the side

frame and directly down to the bed on its supporting leg of the frame. This straight-line power push eliminates twisting of the side frame, minimizes deflection and helps maintain alignment between ram and bed. Automatic force feed lubrication to all major points assures continuous operation. *Struthers Wells Corp.*

For more data circle No. 21 on postcard, p. 122.



## Wire straightener provides 50 to 200-fpm speeds

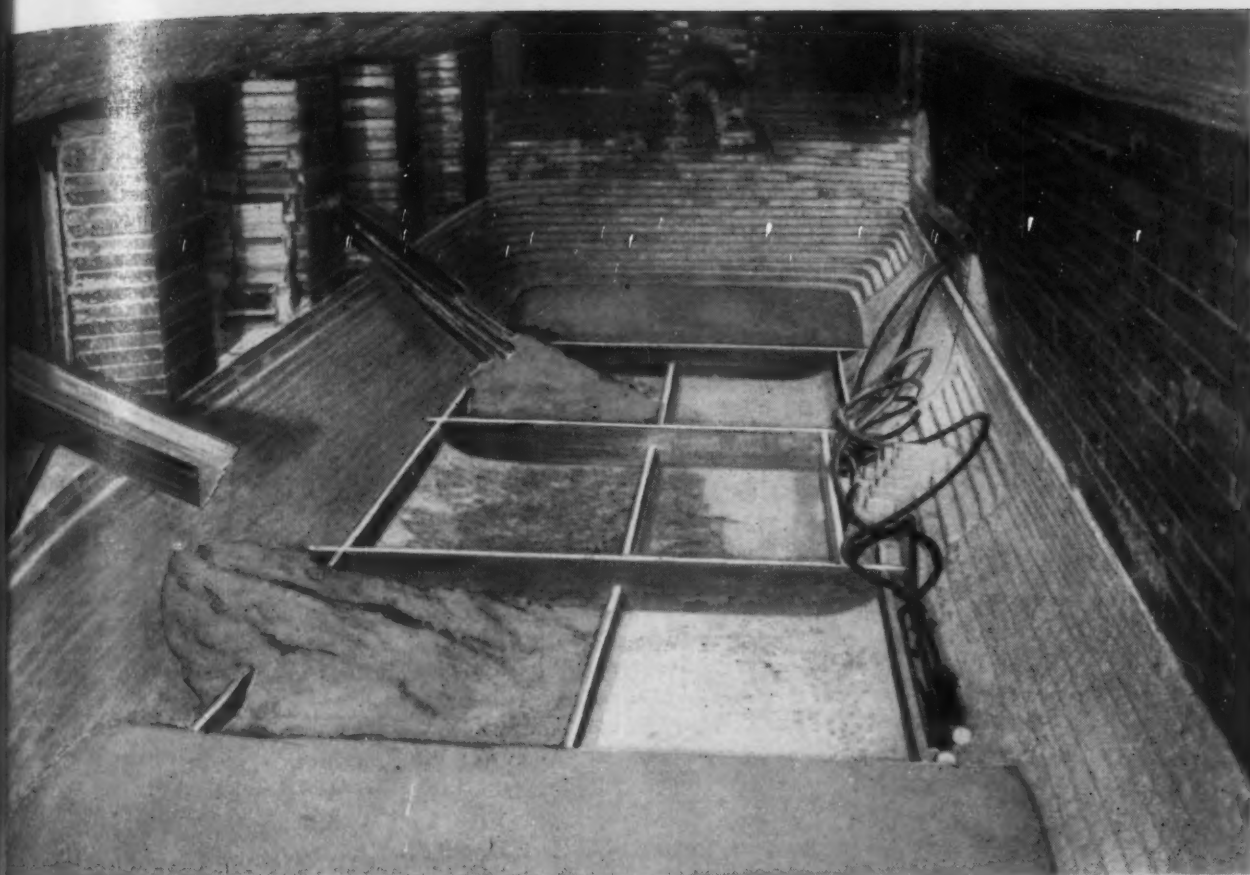
The 1AV Shuster wire straightening and cutting machine features a variable speed drive geared to feed infinite speed changes from 50 to 200 fpm. The one machine will handle both basic and spring wire. Diameters from 3/32 to 1/4 in. basic wire may be handled;

spring wire to 1/8 in. diam. The variable speed drive enables the operator to compensate for differences of temper, alloy and size and still maintain peak productivity. *Mettler Machine Tool, Inc.*

For more data circle No. 22 on postcard, p. 122.

Turn Page





BETHLEHEM STEEL open hearth at Johnstown, Pa. shown during a special bottom installation of Permanente 165 ramming mix

## INCREASE YOUR OPEN HEARTH PRODUCTION

WITH PERMANENTE 165 RAMMING MIX!

THE superiority of Permanente 165 ramming mix for open hearth bottoms is proved by continuing reports from many of the country's leading steel mills. Here are excerpts from two of these reports:

"Furnace producing at rate of 10.7 tons per hour and is rated at 100 tons capacity . . . one ton per hour better than any furnace in the shop!"

"The Permanente 165 bottom in # 19 open hearth furnace producing low-carbon steel is now two years old, has produced 225,000 tons in 1000 heats, and has never had a hole!"

The odds are that this proved superiority can greatly increase production for you.

**SEND FOR BOOKLET** giving all the important advantages of Permanente 165 and the companion material, Permanente 84. Upon request, your Kaiser refractory engineer will promptly offer you research, design and installation service to help you obtain more steel tonnage per year, at lower bottom cost per ton. Call or write principal sales offices: Chemical Division, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, Calif. First National Tower, Akron 8, Ohio.

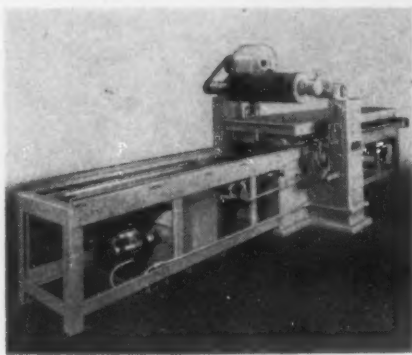


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Pioneers in Modern Basic Refractories

Basic Refractory Brick and Ramming Materials • Dolomite • Magnesite • Magnesia • Alumina • Periclase



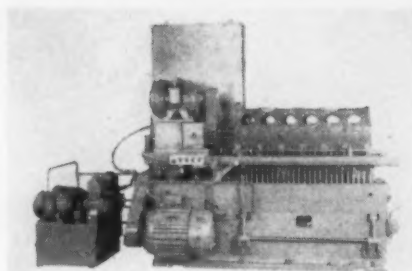


### Horizontal machine polishes extrusions, sheets

The entire length of extrusions, sheets and rods can be polished on the H-M Series horizontal polishing machines. Smaller and odd-shaped pieces can also be handled. The Series H-M is hydraulically operated with provision for obtaining dwell during the polishing action, and has an adjustable stroke with stepless increments from 2 in.

Turn of a valve will oscillate the table across the face of the polishing roll during the stroke. Machines may be equipped with mechanical, polishing compound applicator or spraying equipment. Standard sizes take work from 6 to 20 ft long. *Central Machine Works.*

For more data circle No. 23 on postcard, p. 122.

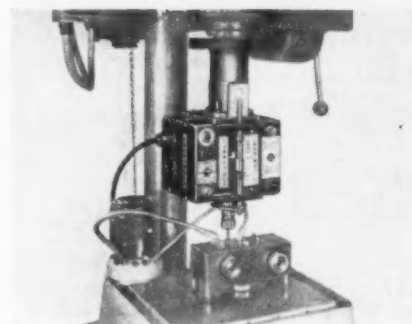


### Machine performs back-spotfacing operation

A 56-spindle vertical and horizontal back-spotfacing machine has a semi-automatic hydraulic operative cycle. It back-spotfaces two lines of 25 holes each in the pan rail face and 6 holes in the accessory end of a V 12-cylinder engine crankcase.

The illustration shows crankcase clamped on workholding fixture, spindle drive motors, hydraulic power unit and the removable positive stop mechanisms which control spotfacing depth. *Moline Tool Co.*

For more data circle No. 24 on postcard, p. 122.

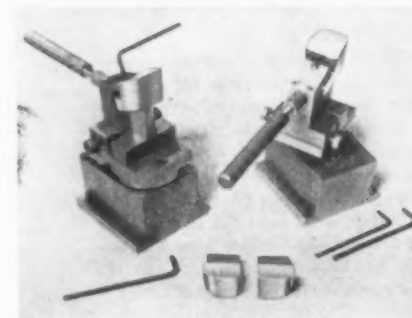


### Precision tapping made simple and accurate

An electrically controlled, automatic high production lead screw tapping attachment with a range of No. 0 to  $\frac{3}{4}$  in. fits any drill press. Called the Lead-Matic tapper, the unit handles all types of production tapping, precision or otherwise. Simple electrical controls on the face of the unit permit quick, easy selec-

tion of the proper tapping action, either jog or cycle, for the particular operation. A precision ground lead screw pilots the tap into the work, producing the finest and most accurate threads possible. The drill press merely provides rotation. *Commander Mfg. Co.*

For more data circle No. 25 on postcard, p. 122.



### Fixture designed for $\frac{3}{4}$ in. radius grinding

A radius grinding fixture has been developed for redressing radius tools, both right and left hand, of the serrated inserted type used for finishing axles with  $\frac{1}{8}$  to  $\frac{3}{4}$  in. radii. Accurate contour on an axle turning operation facilitates the burnishing job which follows. Built-in adjustments allow for tool

wear both on length and width. The fixture fits any table of a standard tool and cutter grinder, and most grinders with mechanical in-feed hand wheel. Can be used to grind or dress other radii within a range of  $\frac{3}{8}$  to  $1\frac{1}{2}$  in. *Apex Tool & Cutter Co.*

For more data circle No. 26 on postcard, p. 122.



### Cold pointing machine has stationary dies

A low-cost cold pointing machine has been built in four sizes for the cold pointing of tubes and bars of steel and nonferrous metals up to 6 in. diam. Dies, which are four in number, are mounted in a fixed spindle head of nitralloy steel and are therefore stationary and do not

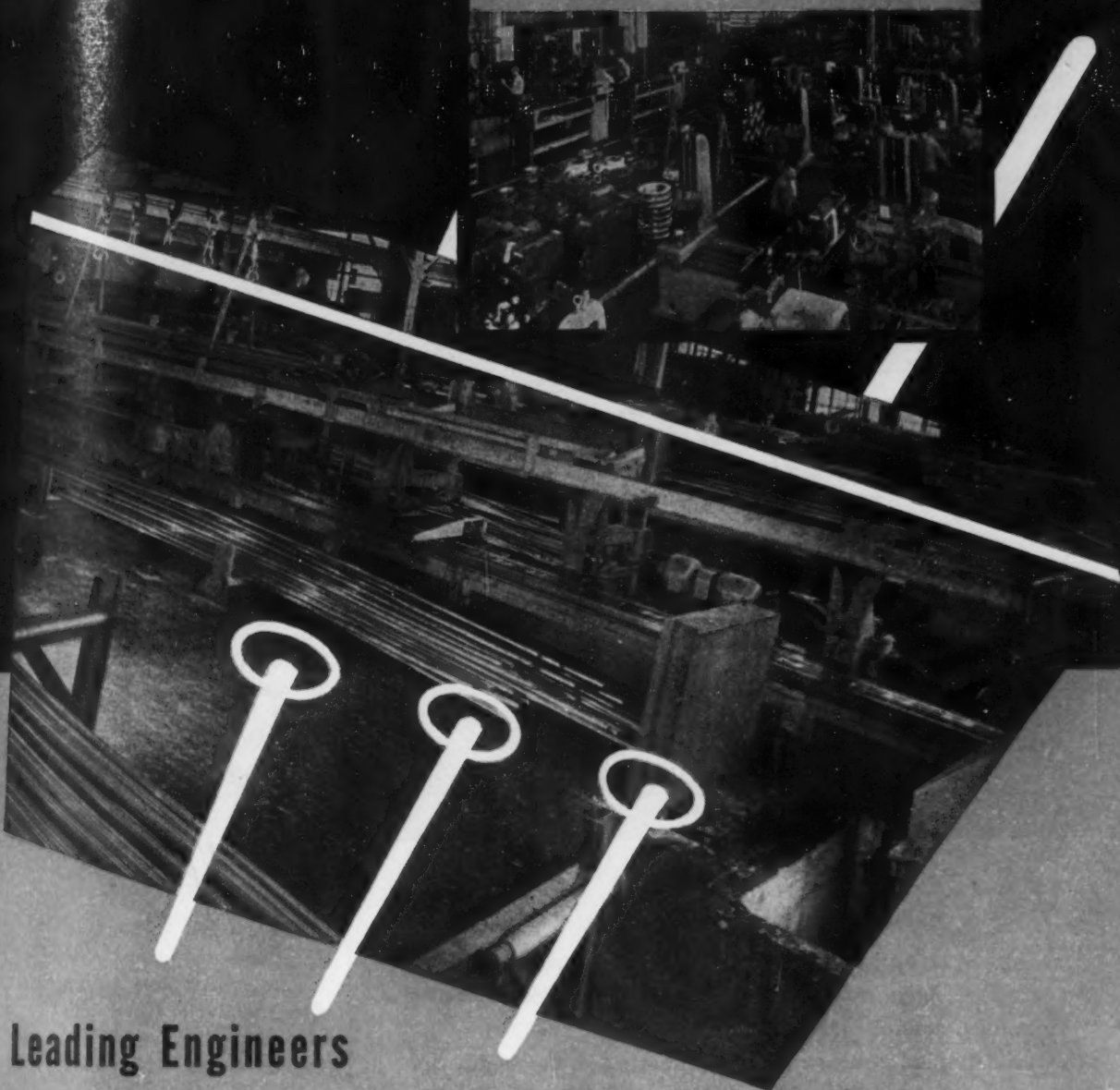
revolve; there is no possibility of dies revolving the tube with risk to the operator. Die wear is taken up by taper wedges between dies and hammer blocks. One man can operate machine. *Abbey Etna Co.*

For more data circle No. 27 on postcard, p. 122.

Turn Page



# THE AETNA-STANDARD ENGINEERING COMPANY



Leading Engineers  
and Builders of  
**DRAWBENCHES**

## Aetna-Standard

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Plants in Warren, Ohio • Ellwood City, Pennsylvania

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Central and South America.

Societe de Constructions de Montbard, Paris,  
France—France, Belgium, Holland, Luxem-  
bourg, Switzerland.

Demag Aktiengesellschaft, Duisburg, Ger-  
many—Germany, Austria, Yugoslavia,  
Greece, Turkey, Egypt.

Compagnia Italiana Forme Acciaio, Milano,  
Italy—Italy.

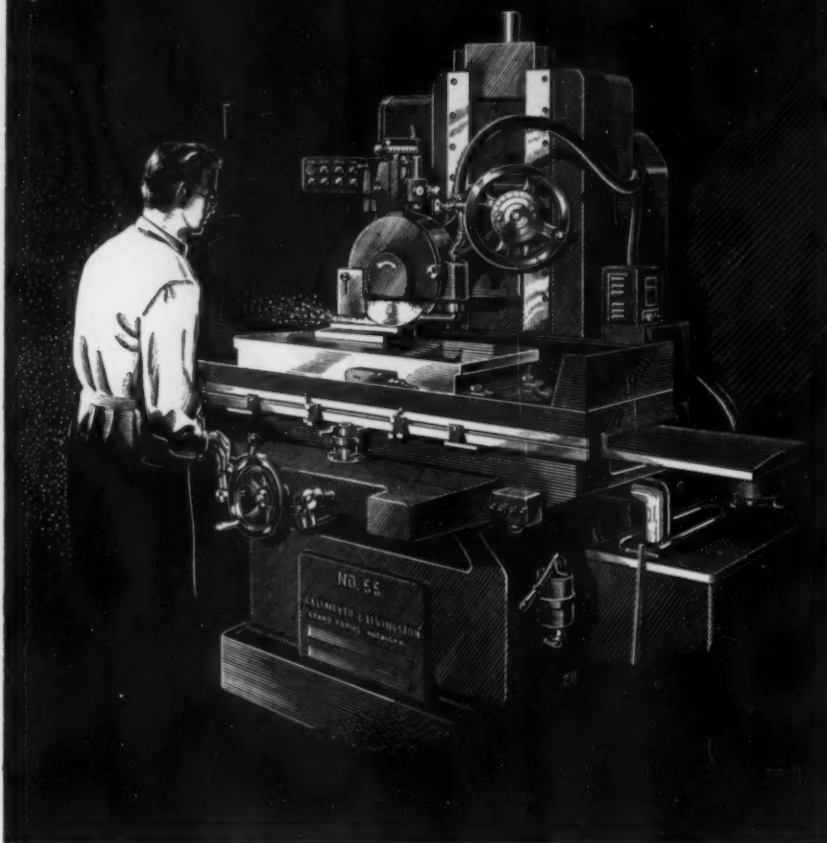
Aetna-Japan Company, Ltd., Tokyo, Japan—  
Japan.

Hale & Kullgren, Inc., Akron, Ohio—Repre-  
sentative for the Rubber Industry.

Designers and Builders to the Ferrous,  
Non-Ferrous, Leather and Rubber Industries



precision *beyond question*



The requirements exacted of surface grinding machines leave no room for variation. Precision and tolerance control must be built-in. Through the years Grand Rapids Grinders have demonstrated the highest quality and unquestioned dependability of performance. Upon this record they have been accorded world-wide acceptance as standard of the industry. Here is precision beyond question.

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## GRAND RAPIDS GRINDERS

MANUFACTURERS OF  
SURFACE GRINDERS, CUTTER AND TOOL  
GRINDERS, TAP AND DRILL GRINDERS

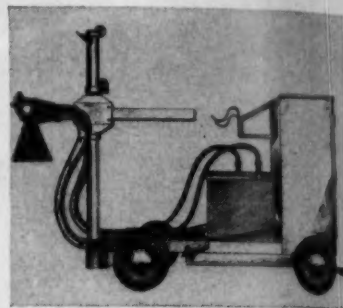


## New Equipment

*Continued*

### Mobile X-ray unit

Flexibility and ease of handling are improvements of a 250-kv mobile X-ray unit for radiographing unwieldy objects that require positive X-ray inspection. The operator has been given added protection so that he can stand inside the cab. Wide inspection coverage is accomplished with a long vertical



column and a horizontal tubearm. Minimum tube-head-to-floor distance is 36 in.; maximum 108 in. Throughout 72-in. vertical travel of the tubehead, horizontal travel is 48 in. The vertical column rotates 360°. Radiographing up to 4½ in. of steel and proportionally thicker sections of lighter density materials is possible. *Westinghouse Electric Co.*

For more data circle No. 28 on postcard, p. 123.

### Abrasive file

Used like a conventional metal file, a new abrasive file has cutting surface that feeds from a coated abrasive roll. The hand tool is designed for deburring and other filing and



finishing operations in the metal-working field. Featuring an 11-in. stroke, the file holds a roll of more than 6 ft of abrasive cloth, that is dispensed as needed to provide a fresh surface. *Minnesota Mining & Mfg. Co.*

For more data circle No. 29 on postcard, p. 123.

Turn to Page 134



# WHERE SOUND TESTS SOUNDNESS



## MIDVALE ULTRASONIC TESTS ASSURE QUALITY BEYOND THE CALL OF SPECIFICATIONS

### Pressure Vessels

### Forgings and Rings

### Hardened & Ground Steel Rolls

### Corrosion and Heat Resisting Castings

### Ordnance & Armor

Sound Waves "bouncing" up to ten million cycles per second seek out and find the smallest defect . . . assure quality forgings at Midvale . . . Ultrasonic waves able to penetrate thirty feet of the toughest steel.

In addition two million volt X-Ray unit . . . magnetic particle inspection . . . "black light" . . . dye penetrants are but a few of the many ways Midvale craftsmen safeguard unsurpassed quality.

Midvale precision and performance can supply all your needs for heavy equipment in industry. Pressure vessels . . . hardened and ground steel rolls . . . weldless rings . . . forgings . . . heat and corrosion resistant castings. If the job is big, specifications exacting, peak quality a "must", you can rely on Midvale craftsmen.

### THE MIDVALE COMPANY

NICETOWN, PHILADELPHIA 40, PA.

OFFICES: NEW YORK • CHICAGO • PITTSBURGH  
WASHINGTON • CLEVELAND • SAN FRANCISCO



# MIDVALE

*Custom Steel Makers to Industry*

PRODUCERS OF FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS



## CASTINGS on the lighter side by **WELLMAN**



If you're thinking along the lighter side about the whole subject of magnesium and aluminum castings, think about Wellman as a source.

As the contractor, standing in one room of his new inexpensive house, said to a friend in the next room, "You can *hear* me, but you can't *see* me? Them's some walls, ain't they!" . . .



"Them's some walls" on a Wellman lightweight magnesium casting, too, thin in appearance but tough enough for our biggest jet bomber landing wheels . . . and easy to machine!

Let us show you how our four complete plants and almost a half century of experience can help you. Write for our new catalog No. 53.

*Well-Cast* **MAGNESIUM AND ALUMINUM CASTINGS**  
*Well-Made* **WOOD AND METAL PATTERNS**



**THE WELLMAN BRONZE & ALUMINUM CO.**

Dept. 8, 12800 Shaker Boulevard

Cleveland 20, Ohio

## New Equipment

Continued

### Sheet metal fabricator

A heavy-duty Wales sheet metal fabricator for punching, notching and nibbling has a 27-in. throat depth with back gage installed and 30½ in. throat depth without back gage. This press permits punching of holes over a greater area in large workpieces. The punch assembly arm swings to the right for quick interchangeability of



punches, reducing setup time and increasing output of parts. Punches and dies are automatically aligned by the holder which permits up to 3½ in. diam holes to be punched. Accurate gaging is provided by an easily adjusted back and side gage. Nibbling around guide plates is practically an automatic operation by positioning the nibble lever to provide continuous operation of the ram. *Wales Strippit Corp.*

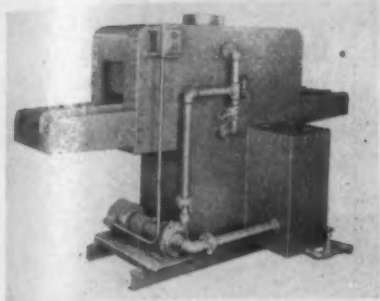
For more data circle No. 30 on postcard, p. 123.

### Water wash compound

Spray booth maintenance costs are reduced by a new compound which makes the reclaiming of paint from spray booths more practical and economical. Klem water wash compound No. 203 is compounded to eliminate nightly draining of tanks. It may be used up to 7 days before draining is required. Circulation lines, water pumps, flow control nozzles and baffles were free of paint sludge at the end of this period in production tests. When properly used with simple control, it is stated that many manhours of maintenance costs and breakdowns are eliminated. *Klem Chemicals, Inc.*

For more data circle No. 31 on postcard, p. 123.





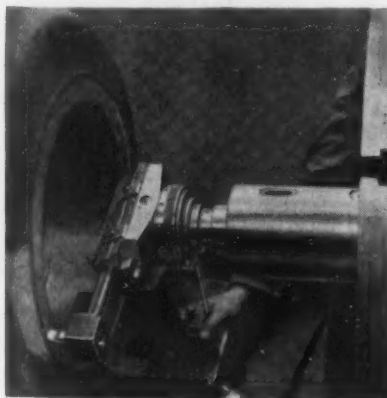
### Parts washing machine

Small parts washing machine is designed for low production jobs or for cleaning between operations. Unit, tank and tables are so arranged that two units can be teamed together for a wash-and-rinse operation. A wheel roller conveyor is designed for standard work baskets. The Niagara paddle wheel instead of a pump can be furnished for screw machine work. *G. S. Blakelsee & Co.*

For more data circle No. 32 on postcard, p. 123.

### Facing, boring heads

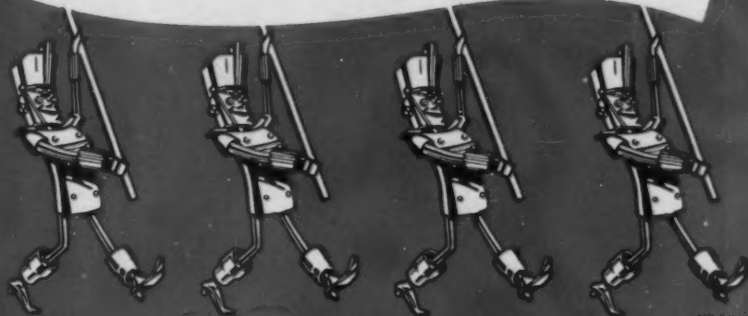
Users of heavier milling, drilling, boring machines, etc., will be interested in two models of universal facing and boring heads made by Wohlhaupter & Co. of Germany. They can be used for boring, facing, recessing, undercutting, taper and form turning. Heavier construc-



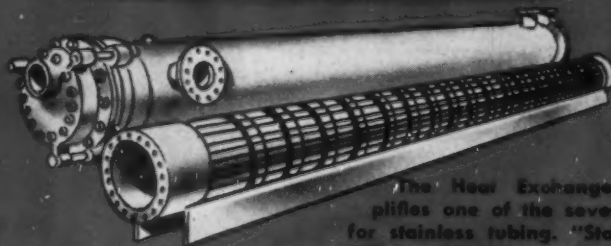
tion provides rigidity for heavy cuts under the most strenuous conditions. Masterheads have automatic feeds, end release and end return, adjustable stop, and are adaptable to all standard machines. Boring and facing range of the UPA 6 is up to 31½ in.; the UPA-S7 up to 36¼ in. *Karl A. Neise.*

For more data circle No. 33 on postcard, p. 123.

# Keep in Step with— STAINLESS TUBING USERS WHO KNOW!



## SPECIFY "Standard" for Welded Stainless Steel Tubing



The Heat Exchanger exemplifies one of the severest uses for stainless tubing. "Standard's" stainless tubing meets this, as well as many other different requirements for strength, and heat and corrosion resistance.

### Deal with the Specialist among Specialists

A tubing specialist, like other specialists, knows his trade best.

When you deal with "Standard" you deal with a tubing specialist who manufactures millions of feet of tubing every month from stainless and carbon steel—and for

25 years has been serving all types of industry for mechanical and pressure tubing applications.

If you need stainless tubing, be sure you specify "Standard". It pays to deal with the tubing specialist among specialists.

#### Stainless Tubing Size and Thickness

¾" O.D. to 3" O.D.

.028 to .095 wall

#### Carbon Steel Tubing

½" O.D. to 5½" O.D.

.028 to .260 wall

### THE STANDARD TUBE CO.

Detroit 28, Michigan

Welded Tubing

Fabricated Parts

STANDARDIZE with STANDARD — It Pays







## *Your* STEEL MILL FROM BLUE PRINT TO OPERATION

... with UNDIVIDED responsibility

FOUR-HIGH STRIP MILL  
DETROIT STEEL CORPORATION  
PORTSMOUTH, OHIO

Designers and Builders  
Pittsburgh Engineering and  
Machine Company

Newly developed Mandrel type  
up-coiler (eliminates under-floor  
installation)



Pittsburgh Engineering and Machine Company's years of experience in the design and building of heavy mill machinery and auxiliary equipment guarantees unexcelled performance and years of trouble-free operation.

Write Today for Complete Information



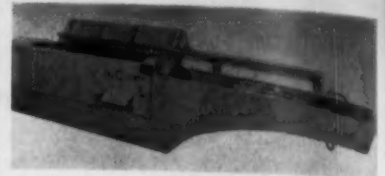
317 Farmer's Bank Bldg., Pittsburgh 22, Pa. • Plant at Glassport, Pa.

DIVISION OF DETROIT STEEL CORPORATION

## **New Equipment** *Continued*

### **Broach carrier**

Time and effort on operations requiring the use of multiple broaches in sequence are reduced by a handy broach carrier rack. It is attached to and travels with the ram of a

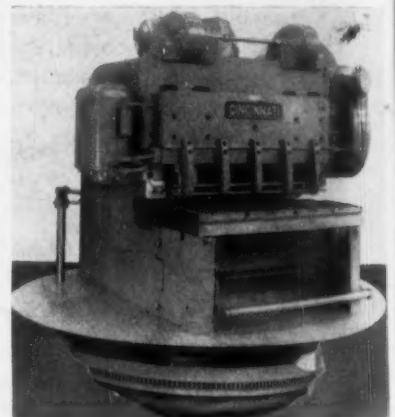


horizontal broaching machine. The rack can be designed for any standard Colonial horizontal broaching machine where broaches are manually handled. The rack has padded broach supports. *Colonial Broach Co.*

For more data circle No. 34 on postcard, p. 123.

### **All steel shear**

An all steel shear capable of cutting mild steel up to 1 in. thick and 4 ft long is mounted on a turntable that rotates by means of a circular rack and pinion. The shear is set



at different positions to eliminate as much handling of large plates and coiled stock as possible. It can be turned to 90° either side of center; weighs 42,000 lb; and operates at 30 strokes per min. A hinged back gage angle permits the cutting of plates longer than the back gage range. Additional features are a light beam shearing gage, ball transfers in the table, and air counterbalances on the ram. *Cincinnati Shaper Co.*

For more data circle No. 35 on postcard, p. 123.

Turn to Page 138



**SAVES 190 MAN-HOURS  
PER WEEK...**



Udylite Full Automatic Installation at Gerity-Michigan Corporation, Adrian, Michigan

## **AT GERITY-MICHIGAN WITH UDYLITE Full Automatics!**

While chromium plating automotive parts on a two-shift basis, Gerity-Michigan Corporation showed direct labor savings of as much as 190 man hours per week using Udylite full automatic equipment.

But that's not all! They have effected substantial cost savings through smoother flow of materials, reduction in nickel buff, better and more uniform plate and lower scrap losses.

Why don't you investigate full automatic plating the Udylite Way. See how your Company, too, can profit by lowered costs . . . savings in manpower. Contact your Udylite Technical Man or write today to THE UDYLITE CORPORATION, DETROIT 11, MICHIGAN. *West of Rockies, L. H. Butcher Company, Los Angeles, California.*

**PIONEER OF A BETTER WAY IN PLATING**

**THE  
Udylite  
CORPORATION**  
DETROIT 11, MICHIGAN





## COLD ROLLED STRIP

*made-to-measure for your products*

### BY FOLLANSBEE

Follansbee Cold Rolled Strip is custom-made strip steel that fulfills most manufacturing needs. Regardless of the stamping or forming operations involved, the quality of Follansbee Cold Rolled Strip offers these real advantages:

- Close tolerances
- Mill finishes for quality products
- Supplied in coils for fast action in presses

You get real production efficiency and time-saving economy when you feed your presses directly from coils of Follansbee Cold Rolled Strip.

Follansbee Steel Corporation is set up to provide you with quick, direct, personalized service. Consult your trained Follansbee Steel representative. He will be glad to discuss your fabricating problems with you.



## FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

COLD ROLLED STRIP

SEAMLESS TERNI ROLL ROOFING

POLISHED BLUE SHEETS AND COILS

Sales Offices—Chicago, Cleveland, Detroit, Indianapolis, Kansas City, Los Angeles, Milwaukee, Nashville, New York, Philadelphia, Rochester, San Francisco, Seattle; Toronto and Montreal, Canada.  
Mills—Follansbee, W.Va.

FOLLANSBEE METAL WAREHOUSES

Pittsburgh, Pa.

Rochester, N.Y.

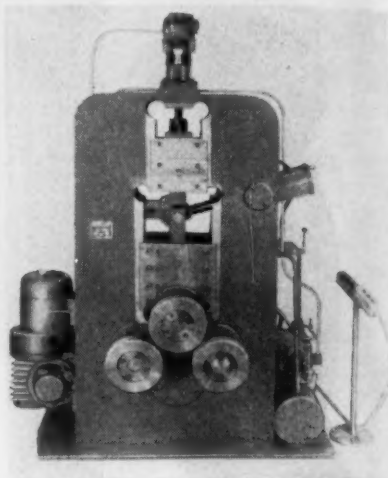
Fairfield, Conn.

## New Equipment

Continued

### Roll bending machine

The Wallace rolling machine is made up of rolled steel plates and sections, electrically arc welded with all welds stress-relieved. It has fast action, repeat positioning roll adjustment. When the initial action of the bending roll is com-



pleted, re-indexing is controlled by the hydraulically actuated toggle mechanism. Short radius bends can be made in rigid material in one pass through the rolls. Maximum capacities depending on size of the rolling machine are: Pipe or conduit 1¼ to 3½ in.; steel tubing 1¾ to 4-in. OD. Wallace Supplies Mfg. Co.

For more data circle No. 36 on postcard, p. 123.

### Indicating controllers

New model Capacitrol has the anticipating action of the Capaciline added to the Electronic Link to give unvarying straight line control. The Capaciline anticipates the approach and departure of temperatures caused by various heat transfer lags and load requirements. The Electronic Link provides fast, accurate control with no contact between the measuring and control system. Also available are four additional Model 200 Series Capacitrols, two for regular on-off control and two for proportioning control, completing the range of instruments for every type of process heat control. Wheelco Instruments Div., Barber-Colman Co.

For more data circle No. 37 on postcard, p. 123.



## Iridium radiography

Iridium radiography sources for non-destructive testing of steel will provide 2 pct definition in steel from about  $\frac{1}{4}$  to 1 in., and give excellent results when used on aluminum and magnesium. Average gamma energy of IR-192 is about 450 DEV. An active 2mm x 2mm source is sealed in an aluminum capsule which is attached to a steel head for ease of handling with a remote magnetic handler. Use of iridium-192 with its low energy gammas reveals flaws which would be undetectable if high energy gamma sources were used. *Tracerlab, Inc.*

For more data circle No. 38 on postcard, p. 123.

## Ribbon-type sealer

A versatile fabric-reinforced black synthetic rubber sealer in ribbon form can be used as an effective weather-proof, water-tight seal. The sealer is easily applied by



simply laying or pressing the ribbon on one surface before riveting, screwing or bolting the second surface to the first. Adhesion properties are such that the ribbon will stay in place on vertical or overhead surfaces during assembly operations. It can be stripped off and reapplied, if necessary. Cloth reinforcement prevents the sealer ribbon from stretching or sagging during application. *Adhesives & Coating Div., Minnesota Mining & Mfg. Co.*

For more data circle No. 39 on postcard, p. 123.



# 7 minutes of WHEELABRATOR®

AIRLESS BLAST CLEANING

results in **7** big advantages  
for weldment producer

### RESULTS

- 1 Improved quality of product.
- 2 Facilitates inspection. Pit holes or "blows" readily spotted.
- 3 Elimination of airblasting.
- 4 Pickling time reduced from 60 minutes to only 5 per piece.
- 5 A balanced production line.
- 6 Surplus Wheelabrator time used for profitable job cleaning.
- 7 Time and cost savings will quickly pay for equipment.

IRRIGATION EQUIPMENT CO., INC.  
EUGENE, OREGON

**THE PRODUCT:** Welded fittings and couplers for sprinkler irrigation, fabricated of 14 gauge tubing, 2" to 6" in diameter, from 6" to 24" in length and weighing up to 15 lbs. each.

**THE PROBLEM:** To remove mill scale, welding flux and spatter and to prepare the surface for subsequent hot dip galvanizing or bright zinc electroplating. Manual airblasting followed by pickling was slow, costly and unable to meet production.

**THE SOLUTION:** Installation of Wheelabrator airless blast cleaning equipment resulted in the benefits shown at left.

Write today for complete details.

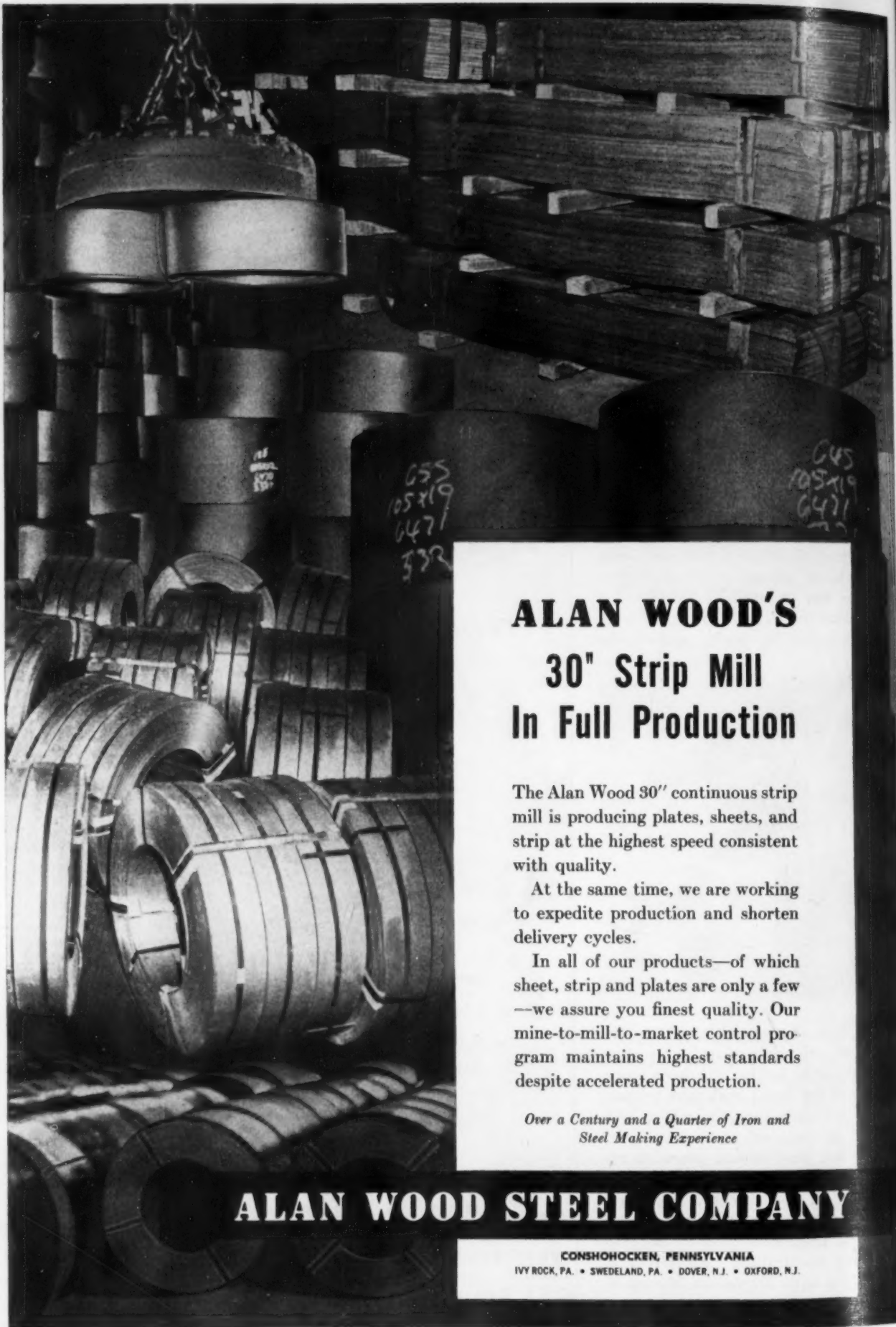
**American Wheelabrator®**  
WHEELABRATOR & EQUIPMENT CORP.  
AIRLESS BLAST CLEANING

510 S. Byrkit St.

Mishawaka, Ind.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST CLEANING EQUIPMENT





## **ALAN WOOD'S 30" Strip Mill In Full Production**

The Alan Wood 30" continuous strip mill is producing plates, sheets, and strip at the highest speed consistent with quality.

At the same time, we are working to expedite production and shorten delivery cycles.

In all of our products—of which sheet, strip and plates are only a few—we assure you finest quality. Our mine-to-mill-to-market control program maintains highest standards despite accelerated production.

*Over a Century and a Quarter of Iron and  
Steel Making Experience*

# **ALAN WOOD STEEL COMPANY**

CONSHOHOCKEN, PENNSYLVANIA  
IVY ROCK, PA. • SWEDELAND, PA. • DOVER, N.J. • OXFORD, N.J.



# *The* **Iron Age**

## **SALUTES**

*Jerome A. Raterman*

He started to learn the lathe business at the bottom, didn't stop when he reached a top job.



**J**EROME RATERMAN had to go to the library in 1917 to find out what an engine lathe was. Today he is president of one of the largest and most progressive lathe making firms in the country.

"Red" Raterman's now famous jaunt to that hall of learning in Sidney, Ohio, preceded his first job at Monarch Machine Tool Co. by just a few hours. He has been connected with the firm ever since.

Born in Minster, Ohio, and educated in Sidney schools, Red is a hometown boy who made good the hard way. His "real education" in lathes was earned as an operator at Monarch in the 4-year period 1917-1921.

After serving in the company's sales and service departments for 6 years Red took charge of Monarch's assembly department and then moved up as head of methods planning.

Once his executive ability had been tested he assumed responsibility for much of the planning and expansion which kept Monarch moving ahead in the post-war years.

In his rise to the top Red served as purchasing agent, company treasurer, executive vice-president and director before taking over as president in 1947. His business philosophy can be summed up by "Keep Modernizing and Keep Selling."

Close business associates say Red's job is his hobby. But until very recently he was very much interested in breeding prize-winning cattle.



STANDS UP UNDER THE SEVEREST FORMING

# WICKWIRE

**HARD DRAWN  
MB SPRING**

**WIRE**



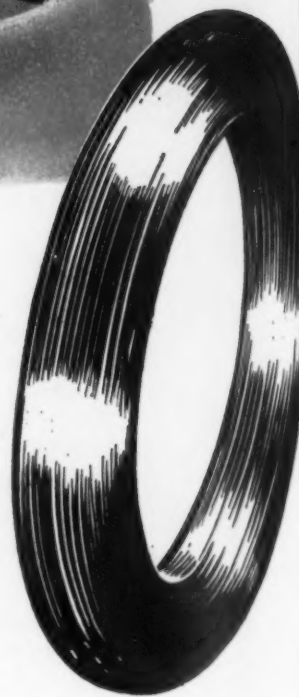
**...Selected and Preferred for Zig-Zag Spring Wire in Automobile Seat and Back Cushions**

Hard Drawn MB Spring Wire produced by Wickwire is used extensively as zig-zag spring wire in the construction of the latest ribbon type of spring units for automobile seat cushions.

Such wire demands the maximum degree of strength, ductility and uniformity in order to withstand the extremely severe deformation necessary in the fabrication of these springs. Painsstaking care must be exercised in the selection of the right steel and in subsequent processing operations.

Wickwire Hard Drawn MB Spring Wire measures up in every way to these exacting demands because every step of its production, starting in our own open hearth furnaces, is under constant control, subject to uncompromising testing and inspection.

Widespread use of Wickwire Hard Drawn MB Spring Wire in this severe service is your assurance that when you select this high-carbon wire for your particular application, you can always count on getting the finest.



THE COLORADO FUEL AND IRON CORPORATION • Denver, Colorado  
THE CALIFORNIA WIRE CLOTH CORPORATION • Oakland, California  
WICKWIRE SPENCER STEEL DIVISION • Atlanta • Boston • Buffalo  
Chicago • Detroit • New York • Philadelphia

**WICKWIRE WIRE**



PRODUCT OF WICKWIRE SPENCER STEEL DIVISION  
THE COLORADO FUEL AND IRON CORPORATION



# The Iron Age

## INTRODUCES

R. A. English, elected vice-president in charge of engineering and production, AMERICAN PIPE & STEEL CORP., Alhambra, Calif.

Harry Eyler, appointed vice-president of sales, TRAILMOBILE, INC., Cincinnati; and James J. Black, appointed vice-president of engineering.

Eric G. Peterson, appointed executive vice-president, PEABODY ENGINEERING CORP., New York.

Charles H. Evans and Paul H. Magnus, II, have been elected vice-presidents, ROSEDALE FOUNDRY & MACHINE CO., Pittsburgh.

Alan L. Higbie, appointed administrative assistant to the vice-president, HENNEY MOTOR CO., INC., Freeport, Ill.

W. Tom Moore, named an executive assistant, Atomic Power Div., THE BABCOCK & WILCOX CO., New York.

Laurence S. Kaplan, becomes assistant to the vice-president, M. S. KAPLAN & SONS, Chicago.

Walter E. Gunnerson, elected vice-president in charge of sales, THE ANDERSON BROS. MFG. CO., Rockford, Ill.

Minier Sargent, named secretary, CATERPILLAR TRACTOR CO., Peoria, Ill.

John F. Kelley, elected treasurer, PULLMAN-STANDARD CAR MFG. CO., Chicago.

E. C. Clark, appointed director of operations, AIR REDUCTION SALES CO., New York.

James R. Russell, elected secretary, ILLINOIS TOOL WORKS, Chicago.

Carl J. Westling, appointed director of engineering, SALEM - BROSIUS, INC., Pittsburgh.

Marion E. Burton, named director of advertising, DENISON ENGINEERING CO., Columbus, Ohio.

W. N. Konrad, appointed product supervisor, CHAIN BELT CO., Milwaukee.

Edward N. Chilson, elected chairman of the board, THE J. G. WHITE ENGINEERING CORP., New York; Ford Kurtz, elected president; Harold P. Jackson, elected vice president in charge of construction; and Robert H. Barclay, becomes vice-president in charge of engineering.

Joseph T. Sloane, becomes director of public relations, TELAUTOGRAPH CORP., New York.

Harry D. Stone, appointed industrial sales engineer, Northwestern Ohio territory, PARKER APPLIANCE CO., Cleveland.

Gordon W. Smithson, promoted to chief engineer, POTTER & JOHNSTON CO., Pawtucket, Rhode Island.

Charles F. B. Price, Jr., appointed sales engineer for wire rope products, Columbia-Geneva Steel Div., U. S. STEEL CORP.

Mike Miller, placed in charge of all activities connected with joint-venture work, KAISER ENGINEERS DIV. of Henry J. Kaiser Co., Oakland, Calif.

T. S. Fuller, becomes consultant, Research & Metallurgical Depts., HEPPENSTALL CO., Pittsburgh.

Frank C. Thompson, Jr., appointed resident sales engineer, Indianapolis, THE METAL CARBIDES CORP., Youngstown.

Charles R. Van Riper, appointed district sales engineer, NORTON CO., Chicago.

Francis D. Skelley, appointed sales engineer, New Jersey territory, HONAN-CRANE CORP.



EARL R. MOHR, promoted to president and general manager, Storms Drop Forging Co., Springfield, Mass.



W. E. BENNINGHOFF, elected vice-president, Ohio Crankshaft Co., Cleveland.



E. E. MOORE, appointed assistant to president and vice-president U. S. Steel Corp., New York.



## Personnel

**King DeSeve**, promoted to manager of manufacturing operations, **WARNER ELECTRIC BRAKE & CLUTCH CO.**, Beloit, Wis.

**Jack H. Cox**, named manager, drainage and allied products sales, **ARMCO DRAINAGE & METAL PRODUCTS, INC.**, a subsidiary of Armco Steel Corp.

**Fred Wehle, Jr.**, appointed manager, newly-created Georgia branch office, **THE E. F. HAUSERMAN CO.**, Cleveland.

**Marvin V. Maxwell**, named manager, Engineering & Service Dept., **WESTINGHOUSE ELECTRIC CORP.**; **Harry H. Chapman**, made manager of Electric Utility Dept.; and **H. L. Martin**, appointed assistant to the district manager.

**A. K. Runkle**, named to post of superintendent, Friction Div., **THERMOID CO.**, Trenton, N. J.

**Donald Hamilton, Jr.**, appointed general sales manager, Ediphone Div., **THOMAS A. EDISON, INC.**

**H. R. McCluckie**, appointed branch manager, Kearny, N. J., **FRUEHAUF TRAILER CO.**; and **E. A. Harrison**, appointed sales manager, Providence branch factory.

**S. Robert Simonds**, appointed Seattle manager, **A. MILNE & CO.**

**Harvey V. Eastling**, appointed assistant general manager, Pacific Div., **LINK-BELT CO.**

**James E. Gray**, appointed assistant manager of carbide sales, **FIRTH STERLING, INC.**, Pittsburgh; and **Stuart A. Smith**, named Ohio district manager.

**L. B. O'Loughlin**, named sales manager, Spark Plug Div., **THE ELECTRIC AUTO-LITE CO.**, Toledo.

**Lyman K. Shepard**, named sales manager, Air-Hydraulic Drill Unit Div., **ROCKWELL MFG. CO.**, Pittsburgh.

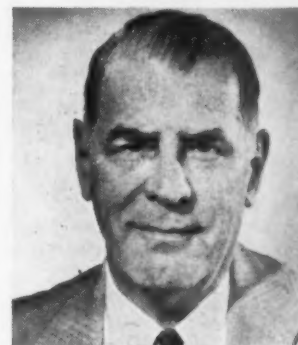
**Dr. Martin de Simo**, becomes assistant sales manager, **CHEMICAL CONSTRUCTION CORP.**, New York.



**EDWIN W. SHIPMAN**, elected vice-president and manager, Licensee Div., **Illinois Tool Works**.



**HENRY ERVIN**, elected vice-president—director of sales, **American Chain & Cable Co., Inc.**



**RANDOLPH J. ROSHIRT**, elected vice-president, **Aluminum Industries, Inc.**, Cincinnati.



**CLIFFORD J. ALPAUGH**, named director of purchases, **Bohn Aluminum & Brass Corp.**, Detroit.

SEND FOR 248-PAGE

# WILMOT CHAIN & CONVEYOR Catalog



As Originators of Rivetless Chain, Wilmot Offers Widest Choice of Chain Sizes and Conveyor Attachments

Catalog 513 is a standard reference on rivetless chain for all applications. Lists the largest available choice of chain sizes and attachments; also every type of part for conveyors and elevators.

Investigate Wilmot DUCTILE IRON Castings—Bulletin 512



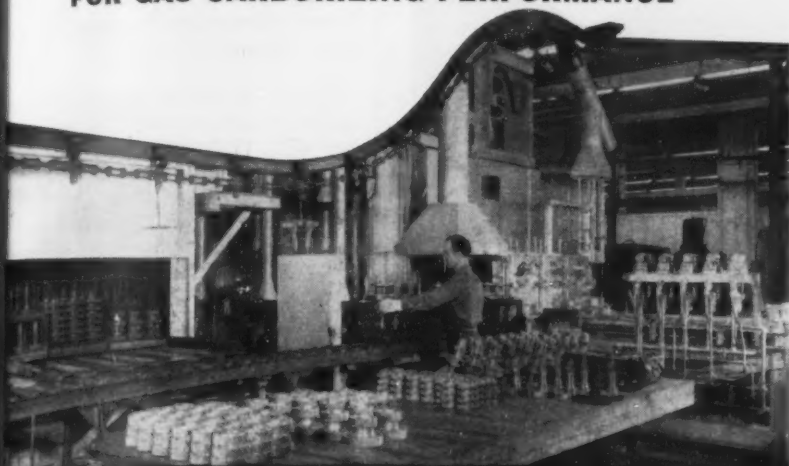
## WILMOT ENGINEERING CO.

HAZLETON, PA.  
Foundry and Shops:  
WHITE HAVEN, PA.



# FORECASTS

## FOR GAS CARBURIZING PERFORMANCE



You'd be amazed (as we are sometimes) at the long memories possessed by some of our furnace engineers. On short notice they'll give you the serial number, location and performance data on furnaces that we installed as long as 10 or 15 years ago — and they're generally right. The point is, the best way to forecast the performance of a furnace not yet built is to check thoroughly the records of similar installations.

### BASED ON 22 YEARS OF "HINDSIGHT"

We have built hundreds of gas carburizers for all types of production requirements. If you are interested in continuous gas carburizing for instance, we can point to the first installation of its kind in 1931. It's still doing a job as reported in our sixteen-page bulletin, SC-134, an important and valuable review of gas carburizing techniques and possibilities. Write for it, on your letterhead please.

**SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO**

ALSO MAKERS OF

**Kathabar** HUMIDITY CONDITIONING

**Janitrol** AUTOMATIC SPACE HEATING

### Current 'Surface' Literature

### YOURS FOR THE ASKING

You may find quick answers to your immediate heat treat problems in these recent Surface Combustion Technical Library publications. Ask for the ones most pertinent to your requirements and we'll send them promptly.

#### bulletins

- SC-134 Modern Gas Carburizing
- SC-158 RX Prepared Atmosphere Generator
- SC-155 Prepared Gas Atmospheres
- SC-149 Pit Type Controlled Atmosphere Furnaces
- SC-147 Rotary Retort Controlled Atmosphere Furnaces

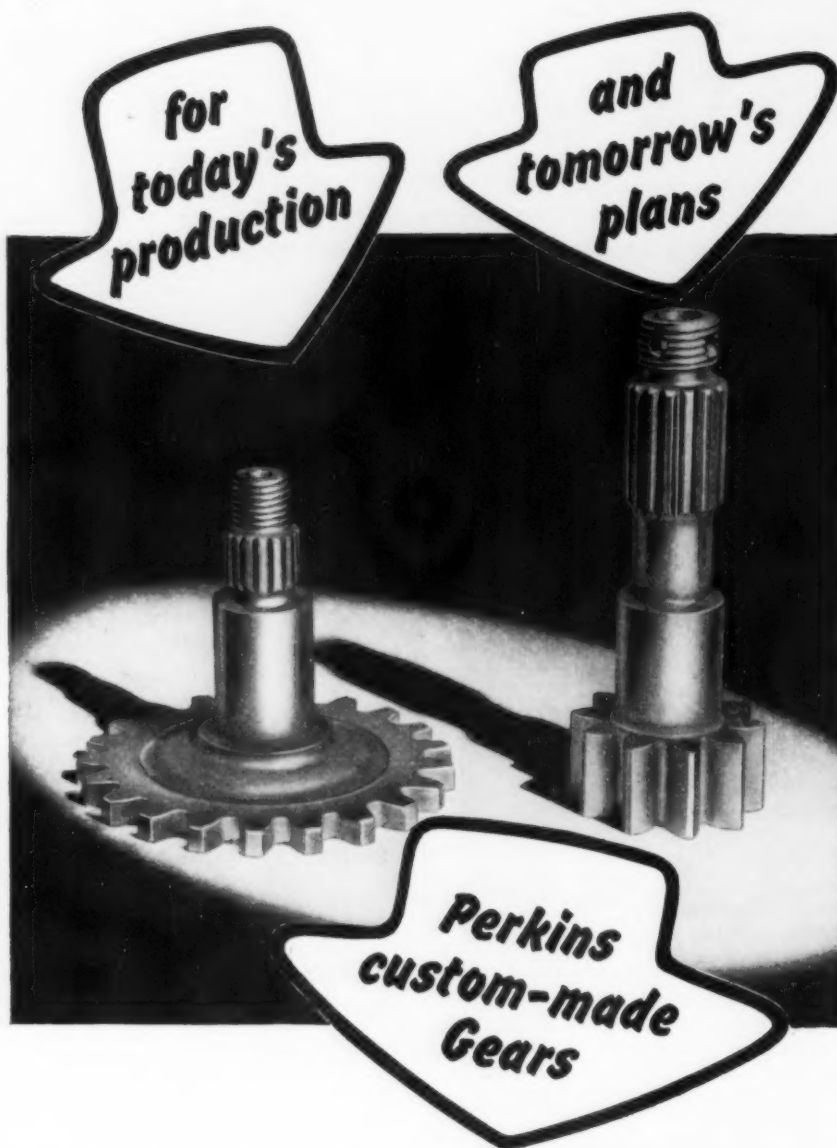
#### reprints

- 53-A Pit Type Carburizing Furnaces Provide Flexible Setup
- 52-C Continuous Carbon Restoration Furnace Boosts Production
- 49-E Furnaces for Gas Carburizing
- 49-B Homogeneous Carburizing
- 47-E Influence of Water Vapor on Gas Carburizing Atmospheres

**Surface**

HEAT TREATING EQUIPMENT





**G**EAR DESIGN and manufacture in general, are ancient arts, but for the requirements of modern machines the scope of analysis, detail design, and test techniques have had to be extended far beyond the considerations acceptable only a relatively short time ago. For example, results obtained by the aircraft industry have revealed greater possibilities for the application of high power gearing.

The high speeds involved in these types of gear drives, however, create particularly strict requirements for accuracy and uniformity of the gears. And this is the very reason why before,

during and since the war, the production of aircraft gears has been our number one job! But regardless of application — from aircraft to washing machines — if your product calls for trouble-free power transmission, it calls for PERKINS custom-made GEARS.

*You Furnish the Specifications  
We'll Produce the Gears*

**PERKINS MAKES:**  
to customers' specifications, in all materials, metallic and non-metallic: bevel gears, ratchets, sprockets, ground thread worms, spiral gears, helical gears, spur gears with shaved or ground teeth.

Have us quote on your requirements.

**PERKINS MACHINE & GEAR CO.**  
WEST SPRINGFIELD, MASSACHUSETTS

## Personnel

*Continued*

Dudley J. Kingman, appointed manager, FRUEHAUF TRAILER CO., Factory-Branch, Cleveland.

Charles F. Hauck, promoted to sales manager, Chemical Plants Div., BLAW-KNOX CO., Pittsburgh; and Bruce Alexander, becomes assistant sales manager.

Harold W. Faint, appointed district sales manager, Chicago, Metal Finishing Div., FREDERIC B. STEVENS, INC., Detroit.

Arnold N. Kraft, appointed branch manager, Linden, New Jersey plant, MATHER SPRING CO., Toledo.

Kenneth V. Lutz, appointed general field manager, ALL-STATE WELDING ALLOYS CO., INC., New York.

Arthur G. Gough, appointed district sales manager, St. Louis area, THE SAWHILL MFG. CO., Sharon, Pa.

Robert E. Scifres, promoted to production manager, Gypsum plants, NATIONAL GYPSUM CO.; and R. E. Gill, becomes production manager, Line Plants.

Robert B. Humphrey, appointed assistant plant manager, FORD MOTOR CO., Lincoln-Mercury Div., Wayne, Mich.; and Joseph N. Locatelli, named assistant plant manager, Lincoln-Mercury Div., Metuchen, N. J.

Paul O. Butler, appointed district representative, REPUBLIC STEEL KITCHENS.

Louis W. Adams, Jr., appointed technical sales representative, Pig Iron Div., PITTSBURGH COKE & CHEMICAL CO.

## OBITUARIES

Ernest W. Krause, 76, chairman of the board and founder, Wheeling Machine Products Co., Wheeling, W. Va.

Alfred B. Sloan, 70, former vice-president and director of Northwestern Steel & Wire Co., at his home in Little Rock, Ark., recently.

Robert H. Briggs, 55, manager, Chemical Sales Div., Chas. Pfizer & Co., at his home in Bronxville, N. Y., after a brief illness.

Terrence W. Griffin, 36, treasurer and secretary, Kensico Tube Co., Inc., Mt. Kisco, at Mt. Kisco Hospital, recently.



# New Stainless Alloy FILLS LONG INDUSTRY NEED

◆ High corrosion resistance, hardenability and machinability in the quench-annealed condition are virtues of the new V2B stainless alloy . . . Corrosion and erosion resistance, plus the metal's nongalling characteristics, have suggested use for valve disks, pump impellers, gears and other wearing parts.

◆ V2B does not overage at elevated temperatures with resultant loss in hardness . . . Copper, molybdenum, silicon and a small amount of beryllium are contained . . . After machining the steel may be precipitation hardened by low-temperature heat treatment.

◆ Experience indicates the metal has high strength in the cast form . . . It can be welded in the solution-annealed condition using V2B welding rod.

By N. F. Mott

Chief Chemist  
and Metallurgist  
The Cooper Alloy  
Foundry Co.  
Hillside, N. J.



◆ THE CRYING NEED for a hard, highly corrosion resistant, and nongalling stainless steel has led to development of a new alloy V2B. Developed by The Cooper Alloy Foundry Co. primarily for valve disks, the alloy possesses other outstanding properties which may permit its use in many other industrial applications.

V2B\* is a hardenable 18-8 stainless alloy containing copper, molybdenum, silicon and a very small amount of beryllium. In the quench-annealed condition it is soft enough to be readily machined. After machining, the steel may be precipitation-hardened by a low-temperature heat treatment, producing no distortion. Only a light heat tinting discoloration is evident and this, if necessary, may be readily removed. V2B can be produced in the cast as well as rolled condition. However, in the latter case, misch-metal ladle additions are necessary to produce hot workability.

The corrosion resistance of V2B in the hardened condition to sulfuric, hydrochloric and phosphoric acids, and their salts, exceeds that of all the other precipitation-hardenable alloys

and even that of type 316 stainless. In nitric acid V2B is also superior to the hardenable grades. Although it is not the equal of types 304 or 316 in nitric acid, it has sufficient resistance to all but the higher concentrations at temperatures around boiling.

The high hardness and strength, coupled with excellent corrosion resistance, plus erosion resistance and nongalling characteristics, suggest many corrosion applications such as valve disks, Fig. 1, pump impellers, gears, and other wearing parts, both at room and elevated temperatures. Unlike other precipitation-hardenable alloys V2B does not overage at elevated temperatures with the resultant loss in hardness. It, therefore, will find many applications in steam accessories where temperatures may go as high as 1400°F.

In the past, attempts have been made to harden 18-8 stainless with beryllium, but practical results have always been disappointing. Early research was made by Kroll<sup>1</sup> in 1929, Bennek and Schafmeister<sup>2</sup> in 1932, and Dickenson and Hatfield<sup>3</sup> in 1933. Although high hardness values were obtained, the necessity of large amounts of very expensive beryllium, loss

\* Patent 2,435,044 issued April 14, 1953.



**Best combination of hardenability and ductility is obtained using beryllium and silicon . . .**

of corrosion resistance, extreme brittleness, and too high a hardness in the quench-annealed state for good machinability prevented its use. In V2B these drawbacks have been overcome.

The presence of 40 to 50 pct ferrite permits beryllium precipitation hardening. This ferrite balance is carefully maintained by analysis control and to some extent by heat treatment. The precipitation hardening of a beryllium stainless steel is due to a difference in the solubility of a beryllide. Solution annealing dissolves the hardening constituent into solution in both the ferrite and austenite. Both these alpha and gamma solid solutions of beryllium can be retained in the supersaturated condition by quenching. Austenite is not too amenable to precipitation hardening as beryllium is much more soluble in alpha than in gamma iron, so the hardening in the alpha state is much more powerful. Owing to the inferior stability of the alpha solid solution, a distinct hardening is produced after only a short tempering at 925°F, while the more stable austenite requires a higher temperature, a much longer time, and an exceedingly larger amount of beryllium.

The optimum composition range established for the best all-around combination of hard-

TABLE I

**HARDNESS AND PROPERTIES OF V2B**

Hardness:	
As-Cast.....	Brinell 302
Quench Annealed.....	269
Annealed and Hardened.....	363
Mechanical Properties:	
Quench Annealed and Hardened	
Tensile Strength.....	151,600 psi
Yield Strength.....	122,400 psi
Elongation.....	3 pct
Reduction of Area.....	2 pct

**BALANCED CHEMICAL COMPOSITION RANGE, PCT**

Carbon.....	<0.07	Manganese.....	0.50 to 0.75
Chromium.....	19.0 to 19.50	Copper.....	2.0 to 2.25
Nickel.....	9.75 to 10.25	Molybdenum.....	3.0 to 3.50
Silicon.....	2.75 to 3.25	Beryllium.....	0.10 to 0.20

ness, corrosion and mechanical properties is shown in Table I. A beryllium content of 0.10 to 0.20 pct is used to effect hardening. Next in effectiveness of hardening is silicon which is not only an active ferrite former, but also promotes precipitation-hardening action. By using 3 pct Si the best combination of hardenability and ductility is obtained.

The other elements control hardenability through the austenite-ferrite balance; nickel, manganese copper and carbon-promoting austenite; chromium and molybdenum-promoting ferrite. Molybdenum in itself exerts a definite hardening effect, and copper may produce a minor secondary precipitation hardening, although it is shown not to be a necessary addition for this purpose only. A study of the effect of composition variance is presented in Table II.



FIG. 1—High hardness and strength coupled with excellent corrosion resistance have made the alloy ideal

for use in solid wedge valve disk, left, and disk for use in air compressors, right.



The alloy V2B is normally water-quenched from 2000°F. This first heat treatment puts beryllium into solution and also dissolves the carbides detrimental to best corrosion resistance. In this condition the metal is machined and then hardened by holding at 925°F for 8 hr and furnace-cooling. No distortion or harmful carbide precipitation is produced in hardening. Shorter cycle times may produce the same hardening effect, but the 8-hr furnace cooling treatment is consistent in all cases.

#### Has high strength in cast form

Water quenching from higher temperatures up to 2300°F causes greater solubility of the beryllide, produces a greater amount of delta ferrite, and at the same time increases hardness in the as-quenched and precipitation-hardened conditions. Hardness values up to 600 Bhn may be produced in this manner. However, lower ductility, great brittleness, and the loss of machinability in the as-quenched condition is experienced. A more desirable combination of properties is obtained at lower hardness values. Table III illustrates the effect of quenching temperature upon final hardness values.

The excellent high strength of V2B in the cast form compares very favorably with other precipitation-hardening stainless alloys. Silicon, beryllium and molybdenum all reduce

TABLE III

#### HEAT TREATMENT AND HARDNESS

C	0.044	C	0.085	C	0.046
Cr	19.35	Cr	19.25	Cr	19.25
Ni	9.55	Ni	8.70	Ni	9.85
Si	3.33	Si	3.80	Si	2.86
Mn	0.81	Mn	0.90	Mn	1.17
Cu	3.40	Cu	2.98	Cu	2.36
Mo	3.47	Mo	2.80	Mo	3.30
Be	0.10	Be	0.14	Be	0.18

Heat Treatment	Hardness Bhn	Heat Treatment	Hardness Bhn	Heat Treatment	Hardness Bhn
As Cast	302	As Cast	277	As Cast	302
2000°F WQ	311	2000°F WQ	285	2000°F WQ	269
WQ + PH	429	WQ + PH	415	WQ + PH	363
2100°F WQ	321	2000°F WQ	302	2100°F WQ	277
WQ + PH	495	WQ + PH	444	WQ + PH	375
2200°F WQ	341	2200°F WQ	352	2200°F WQ	302
WQ + PH	534	WQ + PH	534	WQ + PH	429
2300°F WQ	363	2300°F WQ	372	2300°F WQ	331
WQ + PH	600	WQ + PH	584	WQ + PH	477

Note: WQ = Water quenched.  
PH = Precipitation hardened (8 Hr @ 925°F, furnace cooled).

ductility and top limits must be carefully maintained. To offset lower ductility from these three elements, nickel must be kept as high as possible without too great a sacrifice in hardness.

Examination of Table IV shows that while the corrosion rate in other acids remains the same, the addition of beryllium approximately triples the corrosion rate in nitric acid. However, the rate is still much lower than that of other hardenable stainless alloys and is defi-

TABLE II

#### HARDNESS IN RELATION TO VARYING COMPOSITION

	Variable Silicon						Variable Copper			
	No. V1A	No. 5B	No. 1B	No. 1C	No. 1133-A	No. 8630	No. V13	No. V8	No. 4A	No. 4B
C	0.078	0.040	0.040	0.036	0.068	0.077	0.055	0.084	0.032	0.034
Cr	18.40	19.75	19.25	19.25	19.15	19.05	19.38	19.80	19.40	19.35
Ni	9.94	10.75	10.15	10.35	9.10	9.20	7.85	9.05	10.20	9.80
Si	1.04	2.01	2.34	2.84	3.43	4.20	4.36	2.36	3.18	3.00
Mn	1.09	1.34	1.12	1.12	0.89	0.70	1.11	0.54	1.27	1.12
Cu	3.68	2.56	2.52	2.64	3.11	3.12	0	0	2.04	2.64
Mo	2.79	2.84	2.73	2.67	3.00	2.50	2.20	2.32	2.72	2.75
Be	0.10	0.18	0.14	0.16	0.18	0.18	0.08	0.49	0.15	0.17

Heat Treat	Hardness, Bhn, after Heat Treating									
2000°F WQ	196	212	229	285	311	331	302	321	255	269
WQ + PH	235	248	302	401	429	477	356	444	321	375

	Variable Molybdenum					Variable Nickel			Variable Carbon	
	No. V6	No. 2	No. V10	No. 2A	No. 2C	No. 8A	No. 8B	No. 8C	No. 3891	No. 838
C	0.060	0.068	0.072	0.034	0.046	0.038	0.034	0.030	0.204	0.050
Cr	18.10	18.70	18.83	19.45	19.25	19.40	19.35	19.35	18.00	19.35
Ni	8.94	9.10	8.52	10.30	9.85	8.45	10.40	12.00	9.08	10.10
Si	3.80	4.20	2.32	3.05	2.86	2.98	3.12	3.10	3.05	3.30
Mn	1.13	1.27	1.07	1.17	1.17	1.24	1.27	1.25	1.10	0.55
Cu	3.40	3.12	1.84	2.40	2.36	2.56	2.56	2.52	2.48	3.20
Mo	0	0	1.98	2.12	3.30	2.79	2.61	2.61	2.83	2.66
Be	0.09	0.14	0.14	0.16	0.16	0.18	0.18	0.18	0.18	0.10

Heat Treat	Hardness, Bhn, after Heat Treating									
2000°F WQ	217	255	269	255	269	293	262	229	197	235
WQ + PH	255	340	340	340	363	415	352	277	212	341

WQ, water quench; PH, precipitation hardened.



**Copper and molybdenum were added to build up high corrosion resistance in the alloy . . .**

nately in the useable range. Copper is very important for the best corrosion resistance and decreases the rates in sulfuric and hydrochloric acids tremendously. Molybdenum also effects additional decrease in an appreciable amount and together these two elements make V2B a highly corrosion resistant alloy.

Beryllium and carbon together are harmful. Increasing carbon produces greater corrosion rates in all three acids as well as a tendency toward intergranular corrosion, and it is very important that this be kept as low as possible; 0.07 pct maximum allowed and 0.05 pct preferable. For purposes of comparison, the following data on the corrosion resistance of type 316



FIG. 3—Quench-annealed structure of V2B. Pools of austenite appear in a matrix of ferrite. Etch, 10 pct  $(\text{NH}_4)_2\text{SO}_4$ , electrolytic. 250X.

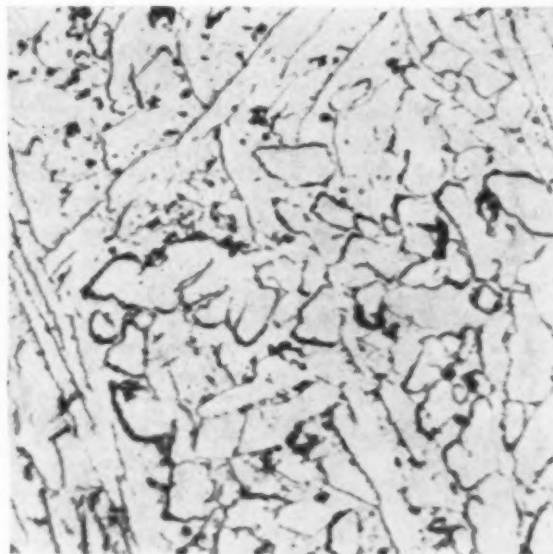


FIG. 2—As-cast structure of V2B. Precipitated carbides and some beryllides have been taken into solution by quench-anneal treatment. Same etch, as Fig 3.  $(\text{NH}_4)_2\text{SO}_4$ , electrolytic. 250X.



FIG. 4—A new phase of the beryllium constituent appears in the ferrite matrix of V2B in the precipitation hardened condition. Etch, 10 pct  $(\text{NH}_4)_2\text{SO}_4$ , electrolytic. 400X.

TABLE IV

**EFFECT OF CHEMICAL ANALYSIS VARIATIONS  
On Corrosion Resistance of V2B in the Hardened Condition**

	No. V5	No. 838	No. V8	No. V6	No. 3891	Type 316
C.....	0.04	0.050	0.064	0.60	0.204	.....
Cr.....	18.02	19.35	19.80	18.10	18.00	.....
Ni.....	8.85	10.10	9.05	8.94	9.08	.....
Si.....	3.74	3.30	2.36	3.60	3.05	.....
Mn.....	1.52	0.55	0.54	1.13	1.10	.....
Cu.....	3.20	3.20	.....	3.40	2.48	.....
Mo.....	2.20	2.66	2.32	.....	2.83	.....
Be.....	0	0.10	0.49	0.09	0.18	.....
<b>ACID</b>						
<b>CORROSION RATE, in. per month</b>						
50 Pct $\text{H}_2\text{SO}_4$ at 80° F.....	0.00019	0.00010	0.05550	0.00118	0.00081	0.11300
5 Pct HCl at 80° F.....	0.00105	0.00100	0.02640	0.00369	0.02090	0.04135
65 Pct $\text{HNO}_3$ at Boiling.....	0.00464	0.01200	0.04080	0.00423	0.08080	0.00190



TABLE V

## CORROSION RESISTANCE OF V2B IN VARIOUS MEDIA

H <sub>2</sub> SO <sub>4</sub>		HCL		HNO <sub>3</sub>		H <sub>3</sub> PO <sub>4</sub>		HF	
At	80° F	At	80° F	At	80° F	At	178° F	At	80° F
50 pct.....	0.00010	5 pct.....	0.00100	65 pct.....	0.00000	65 pct.....	0.00000	10 pct.....	0.17408
65.....	0.00001	10.....	0.02720					20.....	0.22100
78.....	0.00008	20.....	0.05980	At	178° F	20 pct.....	Boiling	48.....	0.02140
		37.....	0.11800	50 pct.....	0.00064	85.....	0.00050	80.....	0.00811
				65.....	0.00095		0.09430		
At	178° F	At	178° F			CH <sub>3</sub> COOH		NaOH	
10 pct.....	0.00167	1/4 pct.....	0.00010						
20.....	0.01170	1/2.....	0.00014	5 pct.....	0.00006			50 pct.....	Boiling
30.....	0.02510			20.....	0.00044				0.00134
40.....	0.05000	2.....	0.00192	30.....	0.00532	100 pct.....	0.00012		
50.....	0.05680		0.00950	40.....	0.00950				
65.....	0.01790			50.....	0.00800	Ca (ClO) <sub>2</sub>			
78.....	0.00041	1/4 pct.....	Boiling	65.....	0.01200	At	80° F		
95.....	0.00005	1/2.....	0.00383			Sat.....	0.00061		
		1.....	0.01820	Mixed Acids					
1/2 pct.....	0.00194			HNO <sub>3</sub> -H <sub>2</sub> SO <sub>4</sub>					
1.....	0.00233			At	80° F				
2.....	0.00516			80-20.....	0.00006				
5.....	0.01800			60-40.....	0.00003				
10.....	0.03030			20-80.....	0.00004				
20.....	0.10400			20-60.....	0.00004				
30.....	0.29400								
30.....	1.10000			50-50.....	Boiling				
					0.00705				

Recorded in inches penetration per month for a typical composition in the hardened condition.

TABLE VI

## HIGH TEMPERATURE CHARACTERISTICS

Hardness After 50 Hr At Temperature

Temperature, Deg F	Bhn
Original.....	340
800° F.....	340
900.....	340
1000.....	340
1100.....	302
1200.....	332
1400.....	351

(18-8SSMo) in the fully water-quenched condition is also given in Table IV. Additional data on corrosion resistance of V2B is given in Table V.

The alloy is readily weldable in the solution-annealed condition using special V2B welding rod containing an excess of beryllium over the usual amount to prevent its loss by oxidation. Shielded-argon arc technique is recommended where possible. After welding, solution annealing of the whole object is recommended for uniformity of properties and maximum corrosion resistance. The usual hardening treatment follows.

To remove the light straw colored heat tinting produced in the hardening treatment immerse in warm 2 pct hydrofluoric, 15 pct nitric acid solution until bright and rinse well with water. In cases where appearance is of no importance, pickling is unnecessary as the slight discoloration has no detrimental effect on corrosion resistance. Castings may be cleaned and pickled after solution-annealing in the same manner as any other chrome-nickel alloy.

V2B does not overage and lose its hardness after long periods of exposure at temperatures to as high as 1400°F. This property opens a

field for its use in high temperature and pressure steam applications. Hardness values after 50 hr at various temperatures are given in Table VI.

The alloy is melted in an induction furnace and generally conforms to the usual practice for chrome-nickel 18-8 alloy. Just before pouring, the melt is thoroughly deoxidized with 3/4 lb calcium-silicon alloy, 1 1/2 lb silicon-zirconium and 1/4 lb aluminum per 1000 lb of metal in the order given. The beryllium is added last as a ferroberyllium alloy of 4 to 5 pct Be content. As soon as the ferroberyllium is melted, the heat is poured. Pouring time should not exceed 5 to 7 min in length. Figs. 2 and 3 show the microstructure (250X) of as-cast and quench-annealed V2B respectively where pools of austenite appear in a matrix of ferrite. Fig. 4 shows the precipitation-hardened condition with a new phase of beryllium constituent in the ferrite matrix.

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# Where Does Shell Molding Fit IN YOUR PARTS PICTURE?



**H. S. Shroka**

Vice President  
Bachner Die Mold & Machine Corp.  
Franklin Park, Ill.

- ♦ Interest in shell molding runs high among foundrymen and metal-working executives . . . Technically the process is moving ahead rapidly, but users have trouble fitting the economics of shell molding into their production setup.
- ♦ Based on experience with a new shell molding machine, the process—costwise and for casting finish—falls midway between regular sand casting and investment casting . . . The new machine turns out up to 120 shells per hour.
- ♦ An unusual pressure back-up system eliminates use of back up shot for molds during pouring . . . Elimination of machining in parts is an important factor in determining whether you can use shell molding.

♦ **SHELL MOLDING** continues to make rapid technical strides, though the economic picture remains cloudy. Based on cost and finish of molded product, the shell molded item seems to stand somewhere between products made by conventional casting and investment casting methods.

Potential users, while interested, are often not fully aware of shell molding costs, and aren't sure just how far shell molding has progressed or what type of job can be handled.

Experience at Powdered Metal Products of America of Franklin Park, Ill., indicates many producers are interested in shell molding processes, but are still in the dark as to what shell molding can do. Experience, based on the machine built by Bach-



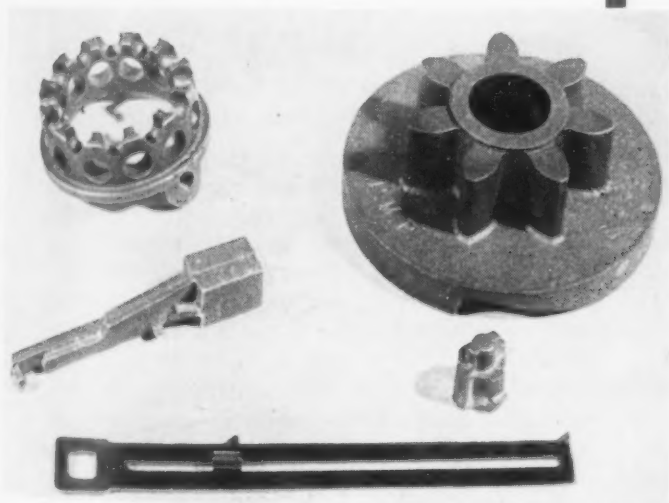
**SIMPLICITY OF OPERATION** and elimination of the need for highly skilled foundry labor are big advantages of the automatic shell molding process. This totally inclosed shell molding machine, built by Bachner Die Mold & Machine Corp., of Franklin Park, Ill., has a 3 min cycle, can turn out up to 120 shell mold sections per hour.



BOTH IN FINISH AND COST, shell molded parts such as this combination gear and control plate fall between regular sand casting and investment casting methods.



REDUCTION IN MACHINING is an important factor in deciding whether you can use shell molding. Shell molding of this phosphor-bronze ball bearing spacer cage permitted attachment lug, bottom spacer ring, and concave ball openings to be incorporated in one casting.



RELATIVELY SMALL parts are being produced successfully at Powdered Metal Products. Gears and parts for locks, clocks and instruments have been made economically.



**Shell mold sections to 12 x 18 in.  
are being produced... Cure cycle  
is 12 min at 450° F...**

ner Die Mold & Machine Corp., is now being marketed. The machine is a single, tip-over unit. The entire assembly requires 150 sq ft of floor space when installed. It will produce a maximum of 120 shell mold sections (cope and drag) per hr in a 3 min cycle. Overhead clearance required for the installation is 11 ft.

Shell mold sections up to 12 x 18 in. are being produced on the original model. These cure at one minute, at 450°F. Heat on the die face is supplied by four cartridge type resistance heaters inserted horizontally into the four quadrants of the die at 1.25 in. below the die face. The working die is 1020 machined steel plate, supported on a 2-in. aluminum base plate.

**Sand-resin mix discharged**

Machine cycle is automatic or semi-automatic. The die with base plate is locked into the machine by a setup man. Four cartridge heaters are inserted in  $\frac{5}{8}$  in. holes drilled in the aluminum base plate. Current is turned on and the die face is brought to working temperature in about 30 min. The automatic cycle then begins.

A filled sand hopper descends onto the face of the die, and discharges sand-resin mixture onto the heated die face. The entire working unit, with die originally at the base and the hopper at its top (in extended position the unit is about 4 ft high), swings over on central pivot. With the hopper now at the bottom and the die over it, excess sand-resin mix falls from the die face into the hopper which again closes on the mix. The tipover cage then returns to original position. The hopper moves up from the die face, an infra red oven slides out over the die face from the rear wall of the unit, and the sand-resin mix adhering to the die face is cured for 1 min.

Following the automatic curing cycle, the slide-over infra red oven withdraws from the die face, pickup pins free the cured shell, and the operator lifts it from the die face for cooling. The die face is cleaned manually with compressed air, sprayed with silicone, and the cycle repeats.

Molds produced in this manner have been used in pouring gray iron, bronze alloys, Alnico, manganese steels. Top commercial pouring temperatures observed here were 3000° to 3100°F, though it is reported that titanium has been shell molded successfully at 3400° to 3600°F. The 10 series and 3140 and 5145 have been poured in shell molds here with good result.

Wall thickness of shells produced in the manner described will vary from 0.25 to 0.125 in.,

depending on metal to be poured or the mold contour.

Major cost item in the production of the shell molds, disregarding die cost, is the plastic binder required. A mixture of three commercial binders has been used in the shell molds described. It was felt that the proper mixture of plastics would attack the cost problem in three ways: quicker curing time, better porosity, and better removal when stripping cured shell molds from a concave or convex die face. Molds are still not fully rigid when stripped from the die face and must be cooled for full rigidity. The average sand-resin mix is about 5 to 7 pct resin by weight.

The proper molding sand may vary in size from 100 to 300 mesh with 120 mesh used in the greatest quantity. The mix of various mesh sizes will depend on the surface desired, but best results are obtained by mixing several grain sizes in one sand-resin batch. The hopper will hold an 8-hr supply of mix and is auto-loading, eliminating down time for refilling.

The 12 x 18 in. die would require about 7 lb of sand-resin mix. This would make a cope and a drag measuring 9 x 12 in. in one 3-min. cycle or two copes and two drags 4.5 x 6 in. each. If required, of course, a single mold slide 12 x 18 in. could be produced in the same time.

The machine currently in operation has a 12 x 12 in. die face. Can produce one mold side in these dimensions, or cope and drag measuring 12 x 6 in. each, or two copes and two drags measuring 6 x 6 in. each. All will be produced in the 3 min cycle with dwell time under the over remaining at 1 min for each different setup.

A simplification of the mold structure has been obtained with a pressure backup system that eliminates the use of shot for backing up the molds.

**Weigh cost against surface finish**

In studying the economics of his job, the shell molder must weigh cost against surface finish required. With a surface configuration obtainable intermediate between that of conventional casting and investment casting, the foundryman must consider each job on the basis of mold cost as weighed against the machining costs eliminated.

A phosphor-bronze ball bearing spacer cage proved economical. The material was poured at 2200°F, utilizing a 5 pct resin-to-sand ratio. It was still necessary to drill a dozen  $\frac{1}{4}$  in. holes through the 0.25 in. wall of the cage base. But the shell mold had permitted pouring of the base ring, the 12 concave openings which would hold the ball bearings, and a lug beneath the ring base for attaching to the machine in which the part would be used.

The shell mold process has proven suitable for small gears, lock parts, and clock and in-



strument parts. Despite the apparent strength limitations of the shell, complex gears having two sets of teeth, with a total thickness of about 2 in., and a diameter of at least 4 in. have been poured in 5145 steel.

Again, it has been possible to pour with chills, in this case low-carbon steel rods about 4 in. long and  $\frac{3}{8}$  in. in diam. These were laid in the mold and a yellow brass head poured at one end of the chill to produce a simple steel-brass part. Four of these were poured in each 6 x 6 in. mold.

Despite adaption of shell molding for mass production in some industries, the producer still receives a number of inquiries for test specimens, indicating that a considerable amount of experimentation must be done by industry before shell molding can be fitted accurately into production planning.

Once the initial die has been prepared, operational time losses are few. The die is attached to a standard die base which provides for heating cartridges, kickup pins, etc. The die base is a table, with the aluminum base plate set on four steel posts. These are machined at their lower ends to lock into four pivoted dogs on the shell molding machine. Bases are standard in their openings for kickup pins, which are air-actuated.

#### Base plate in two parts

A pushup plate beneath the case is pneumatically forced against the die base by rods that are quickly bolted into a plate 4 in. beneath the aluminum die-base plate. The second plate has standard kickup pins at 16 points, and the new die is pierced for these standard pins. The standard  $\frac{3}{8}$ -in. diam pins are considered an integral part of each base plate. The base plate is actually two parts. An aluminum base plate with four legs, and a sub-base plate which carries the kickup pins. To lock the base plate in the machine it is necessary to slide it into the cage in which the hopper rides, lock the dogs at each corner, bolt the push rods from the

kickup plate to the sub-base plate, and the die is thereby centered, levelled, and ready to operate.

There seems to be no theoretical limit to the size of parts handled, though shrinkage must be considered. This increases the tolerance limit with the size of the part. Thus far, reports of 200-lb shell mold castings have been received. Present production castings at Powdered Metal Products however average about 2 lb.

Depth of mold usually does not exceed twice the diameter of the shell mold. Angles and corners are sharper and better defined than in conventional green sand castings.

Shell molds have not been proven conclusively economic as yet for general use. Machine time saved has to be considered, and therefore only a part that would require later machining or a high tolerance finish would be practicable for the process. One user, by eliminating 20 pct of machining time, has found it economic to use the shell mold process. One point worth remembering: A good share of machining time is in the set-up stage. Therefore, the actual production in machining time must be very substantial if any machining is to be done at all.

An outstanding advantage is that shell molds can be stored for an indefinite period before pouring. A melt never is dumped for lack of molds, since a sizable inventory of molds can be kept on the shelf.

Small runs are merely a cost item. In the present, consumer sampling stage, requests are often received for 100 or 200 parts. This does not pay for tooling. A good production run would be about 5000 parts.

Thus far, main interest in this particular shell molding machine has been evidenced by the captive foundries which often work in conjunction with their own tool-and-die shops. Those familiar with shell molding believe that within a year or two the job foundry will find it necessary to give strong consideration to employment of at least some shell molding facilities.

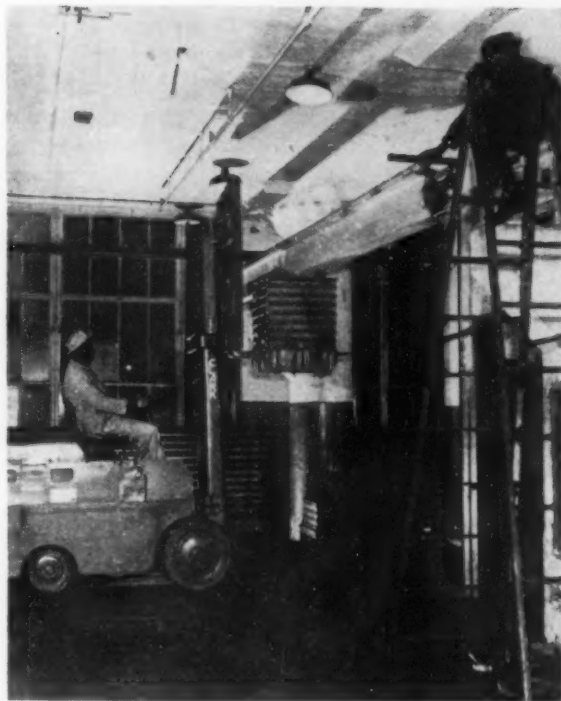
## NEW BOOKS

*"Refractory Hard Metals,"* by Dr. Paul Schwarzkopf and Dr. Richard Kieffer. Recent developments requiring materials with substantial increases in strength and service temperatures has focused attention of engineers on the high melting carbides, borides, nitrides and silicides. The authors, pioneers in powder metallurgy, have given the industry a completely modern book embracing much of the research into these materials. Here are data on the structure, preparation and properties of these materials. It presents a critical evaluation by the country's leading authorities of these basic constituents of the hard metals. The Macmillan Co., 60 Fifth Ave., New York 11. \$10.00. 447 p.

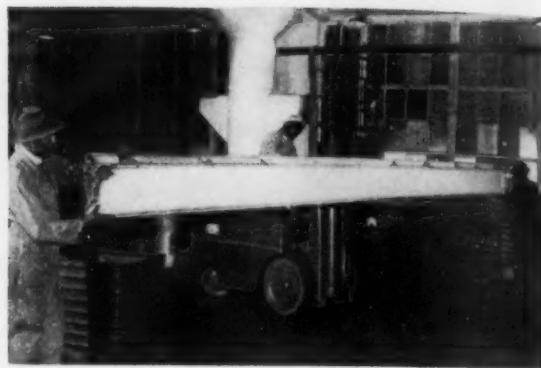
*"Tool Engineers' Data Book,"* by Gerhard J. Gruen. Usefulness of any reference material is often directly proportional to availability, accuracy, and up-to-dateness. Within the framework of these needs, Gerhard Gruen produced his first reference book for tool engineers. It contained an amazing variety of pertinent material. Now, in the book's second edition, the author has up-dated this valuable reference source. Here are heat treatments, alloy specifications, mechanical properties of materials. Much of the information on late developments has never before appeared in book form. Reinhold Publishing Corp., 330 West 42nd St., New York 36. 535 p. \$10.00.



# Fork Truck Eases Down Girder



**BETTER MATERIAL FLOW**, movement of heavy equipment made removal of I-beam necessary at Wagner Electric Co., St. Louis, Mo. Here fork truck gets ready to move beam.



**TRUCK MANEUVERS** beam away from pillars and starts for doorway. Use of industrial truck simplified crew's job.

◆ **WHEN AN I-BEAM INTERFERED** with the movement of machinery and equipment on and off a freight elevator, the maintenance department of Wagner Electric Co., St. Louis, Mo., used its 6000-lb capacity battery-powered fork-lift truck to remove the beam with minimum time and effort.

Expansion of the machining department required the rerouting of the flow of equipment and material through the plant. The I-beam, which supported an unused overhead crane track, was located directly in front of a freight elevator entrance and limited the size of machinery and equipment that could be handled in the area. What might have been a time-consuming and expensive operation resolved into a routine matter of lifting a "load" with the maintenance crew's Elec-Utilitruc, a Clark industrial truck.

The beam was cut and loosened from its moorings, and the fork-truck lifted, moved and lowered the beam to the floor in a matter of minutes. It then carried the beam to a doorway, for pick-up later in the day. A tote-box was used on the forks to hold the beam because the low ceiling restricted the lift of the forks. The driver was protected by a load safety rack attached to the truck lifts.

**LOAD SAFETY RACK** protected operator as beam was eased down from concrete pillars on which it had rested.



# PLANT AIR CONDITIONING Sends Costs Down, Morale Up



By W. G. Patton  
Asst. Technical Editor

- ♦ One hundred pct air conditioning is paying its way in one of the largest metalworking plants in which it has been tried . . . Airtemp Div. of Chrysler Corp. at Dayton, Ohio, has complete control of temperature, humidity and air cleanliness in its 300,000 sq ft windowless plant.
- ♦ Production of range finders for Army tanks, one of the toughest precision jobs Ordnance has handed industry, has been taken in stride . . . Big factor in close tolerance jobs is complete control of the working atmosphere.
- ♦ Employees like the idea . . . Absenteeism is below average, individual productivity is high and turnover rate is low.

♦ COMPLETE AIR CONDITIONING in a 300,000 sq ft metal-working plant has proved its worth with a wide range of manufacturing and auxiliary benefits. Five years' operating experience by Airtemp Div., Chrysler Corp., in its plant at Dayton has more than justified the firm's original decision to build a windowless building in which temperature, humidity and air cleanliness were completely controlled.

A large portion of Airtemp's productive capacities are devoted to manufacture of a highly precise Army tank range finder. Building a range finder requires: (a) Production and assembly of a complex precision mechanical system; (b) an optical system of equal or greater precision and complexity; and (c) tying the two together in an airtight vibration-proof housing.

This type range finder requires higher manufacturing standards in terms of accuracy and freedom from moisture and dirt than most other complex products being made in this country. A stubborn microscopic speck of dirt or a stray piece of lint not visible to the untrained eye, may cost a range finder producer \$1500 or more.

Tolerances are extremely tight. Mechanical

gear trains are ultra-precise. Most major dimensions are held to tenths. A range finder has more than 70 precisely-fitting subassemblies. There are 71 critical optical components.

Every range finder must be tested exhaustively. Visual tests, Fig. 1, require more than 25 hr. There are 12 individual tests to be made after the assembly is completed. Such tests insure that this mechanical-optical instrument will be accurate within 9.2 yd in 1000 yd.

All range finders must go through extended tests at 170°F. A fixed percentage of range finders is checked at — 80°F.

Airtemp performs many machining operations at Dayton on the aluminum housing of the range finders. Precision gears are purchased from outside suppliers. All gears are lapped and matched. Gears in a 6-gear train used in the instrument are matched so perfectly there is a tolerance of only 2.3 min at the end of the train. Largest gear in this train is 1¾ in. in diam.

The need for top quality work is evidenced by the fact that there is one Army Ordnance inspector for every seven workers. All told, there are 90 inspectors. Optical units and all other



**Air conditioning improves corrosion protection . . . Lower costs, higher product quality result . . .**

parts, except for some minor castings and fasteners, are inspected 100 pct.

Advantages of a completely air-conditioned building, Fig. 2, are demonstrated in the production of the range finder housing. A partial list of machining and inspection operations is given in the Table.

Surface milling and milling of three inside pads with a P & W profiler, Fig. 3, is a critical operation. Squareness must be held to 0.001 in. total indicator reading. A 63 microinch finish is required. Parts receive 100-pct inspection after this operation.

Following another surface milling operation and turning a diameter on a No. 3 Plan-O-Mill, operations are performed on a Walker Turner radial drill, P & W profilers, Reed Prentice vertical mill, Fig. 4, and a Kearney & Trecker No. 4 slot milling machine.

This is followed by slot milling, profile milling and turning and chamfering one end of the casting. This latter operation, performed on a Heald Borematic, establishes the critical centerline in the casting.

**Use vacuum for cleaning**

Most of the remaining operations involve drilling, counterboring, countersinking and chamfering. A small amount of turning and slot milling is required.

Typical of the requirements that must be met is holding the milling of a keyway on a Lucas mill to 0.002 in.

After all machining operations are completed, a special fixture gage is used for a final check. This gage repeats location within 0.0002 in. Indicator gages accurate to 0.0001 in. check all principal dimensions to the mechanical centerline.

Assembly of the range finder is performed on a special fixture, Fig. 5, equipped with rollers. Employees use a vacuum hose frequently to remove small burrs or particles of dirt generated locally or brought in with the part. Each step of the assembly operation is carefully checked before proceeding to the next operation.

Following assembly of electrical and mechanical components, a sealer is applied and the assembly is pressure-tested. The casting is then ready for insertion of the optical system. During the intervening period all openings, Fig. 5, in the casting are closed.

When production started, untrained workers sometimes required 30 min to 1 hr to clean one of the optical components. Time required for cleaning the 71 pieces of optical glass in the

instrument has been substantially reduced since production started.

At the time the range finder was tooled, no spectrometer capable of checking the optical glass to required accuracy was immediately available in this country. An Italian instrument was eventually found with sufficient accuracy to meet the requirements of the job.

Following assembly, instruments are filled with dry nitrogen and thoroughly checked. However, before shipment it is necessary to subject each range finder to an exposure of 170°F for 4 hr. All instruments are vibration-tested for 18 sec prior to packaging in a special shipping container.

**Temperature, humidity controlled**

Closely held operating temperatures throughout the plant contribute to the ability of employees to adhere to rigid dimensional requirements. Tight control of humidity is equally important, particularly as a limiting factor on corrosion. Experience at the Dayton plant shows this protection from corrosion of partially finished surfaces, precision machines and costly gages is making an important contribution to both the reduced cost and high quality of the product.

Because of the clean conditions prevailing throughout the plant, management feels it receives dividends in maintained high quality workmanship.

The wisdom of building a windowless plant was seriously questioned in 1947 when the present building was completed. At the outset, \$125,000 was saved in the cost of windows. It is estimated that cost of maintaining these windows since then would represent an even larger sum.

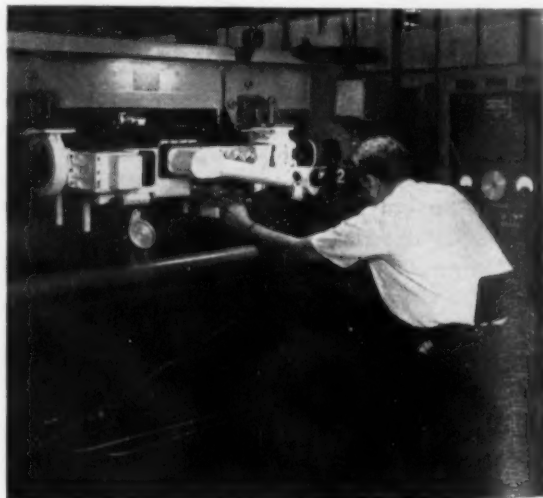


FIG. 1—Visual testing of a range finder requires operators with keen eyesight and uniform, day-to-day stereoptical perception.



According to Airtemp officials, no employee has left the company because he was required to work in a windowless plant. On the other hand, many capable employees have joined Airtemp because they were attracted by the working conditions.

While no exact comparisons are possible, absenteeism has been exceptionally low. Turnover has been substantially below the figure for most Dayton manufacturing establishments. Employee productivity has been excellent, particularly during the summer months when other plants have found output lagging. Worker fatigue is noticeably reduced during hot weather.

Air in the plant is changed every 3 min. Eight central stations, Fig. 6, located on the roof furnish air to the main factory. Each system has a 75 hp and a 40 hp compressor. The system supplies 340,000 cu ft per min.

Airtemp also installed 43 5-ton packaged air conditioners in offices. Outside air is handled by 23 other 5-ton split units installed between ceiling and roof. The 43 units each handle 2000 cu ft of air per min while the split units each handle 1200 cu ft per min.

#### Machines supply plant heat

Heating in winter is supplied through packaged units using hot water coils and with steam coils through the central station system.

A dry bulb temperature of 72°F is maintained constantly throughout the plant during winter and 78°F during summer. Relative humidity is held at 50 pct. Engineers estimate that about 40 pct of the heat load is supplied by the machines operating throughout the plant.

Officials say several advantages of air conditioning were not fully anticipated at the time the plant was built. The advantages of complete

freedom of movement throughout the plant were undervalued. Advantages of having completely uniform temperatures in which to perform all precision machining operations, make all precision measurements, store and use all precision gages, Fig. 7, and store all materials were not entirely anticipated.

The substantial reduction in plant maintenance expense was not anticipated. There were also many unforeseeable benefits with respect to hiring new employees, attractiveness of working conditions and improved employee morale. Freedom from dust in the atmosphere has led to minimum maintenance problems with electronic controls.

#### Turn Page

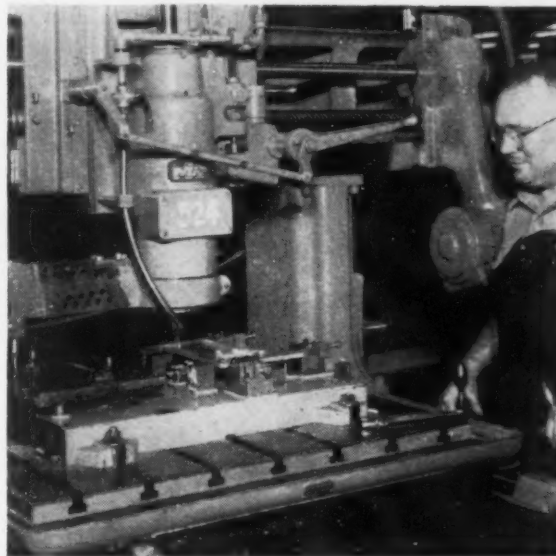


FIG. 3—Three inside pads and a surface milling operation are performed on this precision-built 30 in. P & W profiler. Squareness must be held to 0.001-in. total indicator reading.



FIG. 2—There isn't a window in this 300,000-sq ft completely air-conditioned plant operated by Airtemp Div., Chrysler Corp. at Dayton. Estimated cost to provide

windows was \$125,000. Better insulation also meant a reduction in heating costs. Many new employees have been attracted by better working conditions.



## ROUTING LIST FOR A RANGE FINDER HOUSING

- 1—100 pct inspection of aluminum housing.
- 2—Test in qualifying fixture.
- 3—Finish mill surface and 3 pads with 30 in. P & W profiler with side head.
- 4—100 pct inspection.
- 5—Finish mill one surface and turn diam on a No. 3 Plan-O-Mill.
- 6—Drill 2 holes and an elongated slot in a Walker Turner radial drill.
- 7—Profile mill 2 pads on a 30 in P & W profiler with attachment for follower pin. Mill slot 7/32 in. deep.
- 8—Mill pad opposite locating surface of casting on 30 in. P & W profiler.
- 9—Step milling of inside pads and 2 pads on side A. Reed Prentice vertical mill.
- 10—Mill wide slot on housing. Horizontal Kearney & Trecker No. 4.
- 11—Profile mill sealing groove. 30 in. P & W profiler with side head.
- 12—Turn and chamfer one end of casting and establish trunnions for center line. Heald Borematic fixture.
- 13—Drill, counterbore and countersink all holes in "A" side of housing on Walker Turner radial drills.
- 14—Drill and countersink all holes on one surface, on one pad and inside casting.
- 15—Drill and countersink all holes on side "B".
- 16—Finish turn and chamfer operation, using B'matic fixture.
- 17—Inspection.
- 18—Mill keyway on Lucas mill.
- 19—Drill, countersink, ream holes in both ends and 1 hole in bottom.
- 20—Inspect complete.
- 21—Degrease and finish.
- 22—100 pct inspection.
- 23—Deburr and countersink all holes.
- 24—Tap 2 holes.
- 25—Tap all holes on side B. Cleveland Tapper.
- 26—Tap all holes on one surface. Cleveland Tapper.
- 27—Check complete.

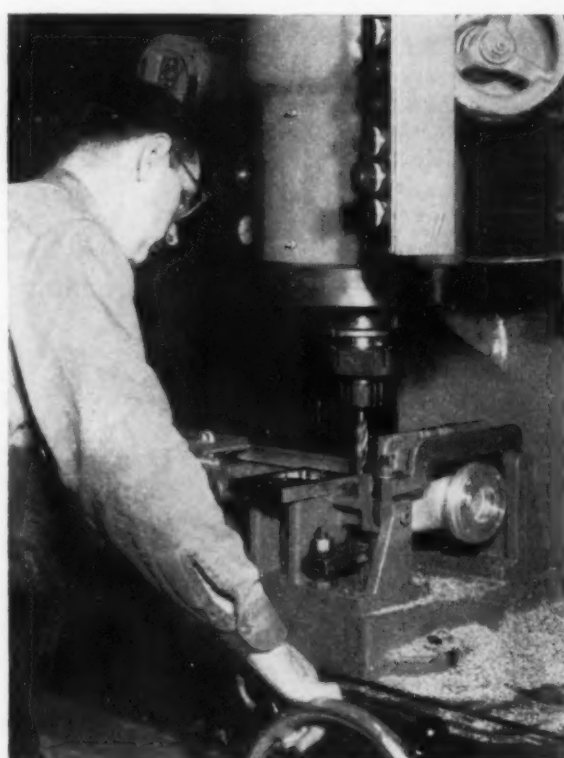


FIG. 4—Step milling of inside pads and two outside surface pads is performed on this Reed Prentice mill.

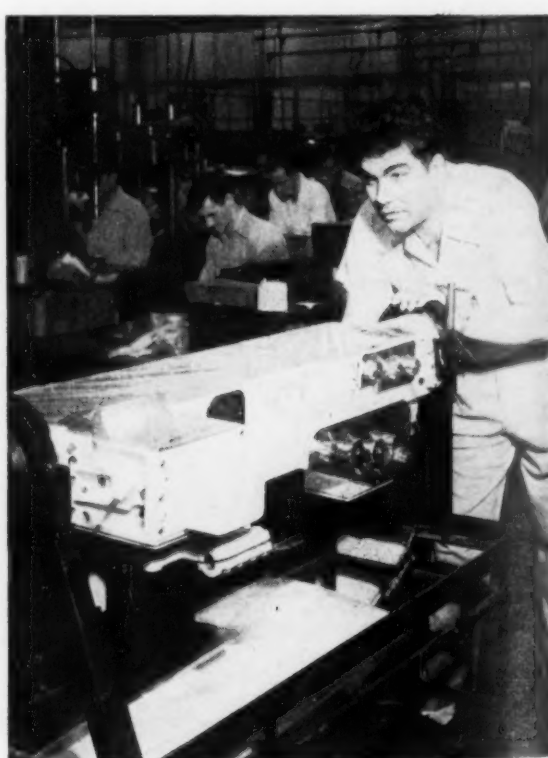


FIG. 5—This special roller mounted fixture is used to assemble the mechanical components of the range finder.

Should you buy advice?—

## SMALL BUSINESS GAINS From Consultant's Broad Experience



By George T. Trundle, Jr.

Chairman  
Trundle Engineering Co.  
Cleveland

♦ HOW CAN SMALL BUSINESS benefit from the services of the consulting management engineering firm? This oft asked question reflects an impression that professional consulting management engineering firms serve only the large corporations. Nothing could be farther from the truth.

The idea that the services of a consulting engineering firm constitute a luxury which only big companies can afford does not agree with the facts. A great many of the more than 6000 assignments handled by Trundle Engineering Co. since it was organized have been for small business organizations. These approximately 1000 clients covered more than 400 different industries, businesses, institutions and govern-

mental organizations. Many of these assignments represented specific jobs undertaken for companies which today would be termed "small business"—that is, companies with from 400 to 900 employees.

Another misconception surprisingly prevalent is that consulting engineering firms administer only to sick companies. This again is not supported by the facts. Companies, large or small, do not as a rule call in a consulting management engineer because they are sick.

Business organizations retain the services of a consulting management engineer primarily for the following reasons:

1. Because they have a particular problem and believe that the experience and professional skill of a management engineering firm may help to solve that problem.

2. Because their own personnel are too busy handling day-to-day affairs to give that problem the special study and objective viewpoint which it deserves.

### Captive Foundry Operation

Small business hands the consulting management engineering firm a wide range of problems. One of these was a request to study the operations of a captive foundry with the objective of reducing costs and improving performance and production. Poor workmanship, lack of supervision and lack of controls were found. As a result, many castings were defective. These defects often were not discovered until after castings had reached the machine shop and much money had been spent on machining.

Installation of tight controls, primarily to reduce scrap, were needed. Recommendations included:

Careful analysis and storage of materials.

Installation of mix sheets for the cupola during heats.

Installation of weight sheets of classifications of scrap and pig taken to the charging floor for heat.

Installation of pouring sheets to record alloying materials added at the spout.

Redesigning of the loaming pit.

Installation of a circulating air-type mold dryer.

An improved method of making cores in the jolt.

Changes in assignment of responsibilities between first and second shifts, in plant layout, in materials handling methods and changes in the practice of assembling cupola batches were also required. Purchase of new equipment to replace obsolete models was recommended.

Installation of accounting controls; a detailed study as to the utilization of various types of equipment; production, quality and labor controls; cost analysis, time keeping methods were also involved.

Estimated savings at the completion of this study, later realized, were \$227,000 annually



## ADVANTAGES OF AIR CONDITIONING FOR PRECISION MANUFACTURING

### MANUFACTURING BENEFITS:

- 1—Closer tolerances can be held.
- 2—Minimum size variation by materials in process, precision gages, fixtures and machine tools.
- 3—Rejects are reduced to a minimum.
- 4—Controlled humidity arrests corrosion of precision machinery and gages; prevents corrosive damage to work in process.
- 5—Deterioration during processing and storage is minimized.
- 6—Building maintenance expense is reduced.
- 7—A well-insulated building results in substantially reduced heating expense.
- 8—Uniform manufacturing conditions promote production of a uniform, high quality product.
- 9—Minimum storage space is required and loss of

conditioning time is small for precision manufacturing.

- 10—Maximum reliability of electronic controls.

### MANPOWER BENEFITS:

- 1—Productivity per man-hour has been high.
- 2—Controlled temperature and humidity delay fatigue and encourage uniform production throughout the day.
- 3—Absenteeism is low.
- 4—Labor turnover has been low.
- 5—Desirable workers are attracted to the plant's clean, comfortable, uniform working conditions.
- 6—Personnel is remarkably young. All top executives are in 40-45 bracket. Average age of all employees is substantially below average for manufacturing plants in Dayton.
- 7—Due to improved working conditions, there have been no summer slowdowns or loss of production.



FIG. 6—Eight roof stations like these furnish air to the main factory. System supplies 340,000 cu ft per min.



FIG. 7—Air gages are used extensively at Dayton to check critical dimensions of tank range finders.

June 18, 1953

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## What Size Plant?

What size plant is best? This important question faces many small businesses whose growth demands larger plant facilities. One company, manufacturing electrical equipment, commissioned Trundle Engineering Co. to lay out a proposed new plant in two sizes—225,000 sq ft and 180,000 sq ft. Each was to incorporate the most efficient flow of material and utilization of facilities. In each an estimate of potentialities was required.

This was primarily a statistical study. The larger plant was presumed to include facilities sufficient for the potential expansion of the company's business. Estimates of possible savings were in both cases based upon the current volume of production within the company.

Estimates of labor savings revealed that the large plant could produce \$218,000 in economies

while the smaller plant would yield \$198,000—a difference of \$20,000. But the smaller of the two overcame that difference by the relationship of labor costs to fixed expenses. The fixed expenses in the larger plant would be \$145,000, or \$32,000 more than in the smaller. While the larger plant would yield \$20,000 more in labor savings, the smaller plant would save \$32,000 more in fixed expenses. This gave the smaller factory a savings margin of \$12,000 over the larger.

Here is an example of how a consulting engineering firm can help a company evaluate the comparative possibilities of two courses of action. The company can then make its own decision in the light of the facts it has in hand. The dollar figures in this illustration are indicative of the small size of the company.

## Potential and Production

An eastern financial firm requested a survey of fruit and vegetable canning company to determine whether or not they should underwrite its financing.

The study indicated that the company's potentialities, aided by operating and sales suggestions, were excellent. One recommendation

was that a new product be added to the canning line. This would permit operation through 11½ months of the year instead of the former seasonal basis of 9½ months. The survey also showed output of byproducts could be readily increased by installation of additional equipment.

## A Straight Engineering Problem

A distinct engineering problem was presented by a company manufacturing a welding gun. A special mount was required for each of its applications to a specific industry. Engineering work required ran development costs clear out of line. What was needed was a flexible mount adaptable to a variety of industrial

purposes. Such a mount would cut costs.

Past experience was studied and future requirements surveyed. Result was design of a mount of sufficient adaptability to a wide variety of uses. Engineering and development costs were cut to proper size, making possible production and sales at a profit.

## Job Evaluation and Incentives

Plantwide job evaluation and installation of an incentive program was requested by a manufacturer of a complete line of office records and business supplies.

Working with representatives of the company and the union, Trundle engineers coached the men in the methods of time study and incentive installation. This gave both sides of the management-employee team a firm idea of the goals the Trundle engineers were attempting to achieve.

Each machine in the incentive program was checked to correct settings and eliminate errors and downtime in operation. Speed of one machine, for example, was increased 25 pct, new standards were set, and the operation was started on the incentive plan. The incentive standard was set at 1280 units per hour and the

incentive performance resulted in 1450 units, an increase of 61 pct in production.

On a second machine, mechanical changes were made and its speed was increased 14.5 pct. Under incentive performance production increased from 133 units per hour to 200 units per hour.

This job brought to light an interesting illustration of the relationship between psychology and productivity. One operator had operated a particular machine at the same speed over a period of 15 years. It was hard to get him to change his mind as to how fast this machine could be properly run; but as he got into the spirit of what was happening in the plant, he began to step things up. The end result was that he increased his output on this machine by 78 pct.

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# Eliminate Air and Stream Pollution

◆ ONE OF THE MOST MODERN gas cleaning facilities in America can be proudly claimed by American Steel and Wire at its Donora, Pa., plant. This U. S. Steel Corp. division recently completed a 14-year program designed to eliminate air and stream pollution from its blast furnace operations.

First, a gas washer with a capacity of 18,000 cfm was installed to clean stove gas for the No. 1 blast furnace. Later, a second washer was installed to clean gas from the No. 2 blast furnace stoves at the rate of 30,000 cfm.

Steps were taken to prevent stream pollution. In 1939, a 35-ft single-tray thickener was constructed to recover flue dust. When the gas washer for the No. 2 furnace was completed in 1942, the thickener was enlarged to a two-tray unit. Waste water from both washers was sent to this thickener. Sludge was recovered for the sintering plant and clear discharge water returned to the river.

To bring blast furnace operations in line with new regulations against air and stream pollution, new facilities were installed to fine clean all gas produced by the blast furnaces. These include gas washing equipment, pumping facilities, a single-tray thickener, a filter house and 32 gas boiler burners. Auxiliary oil

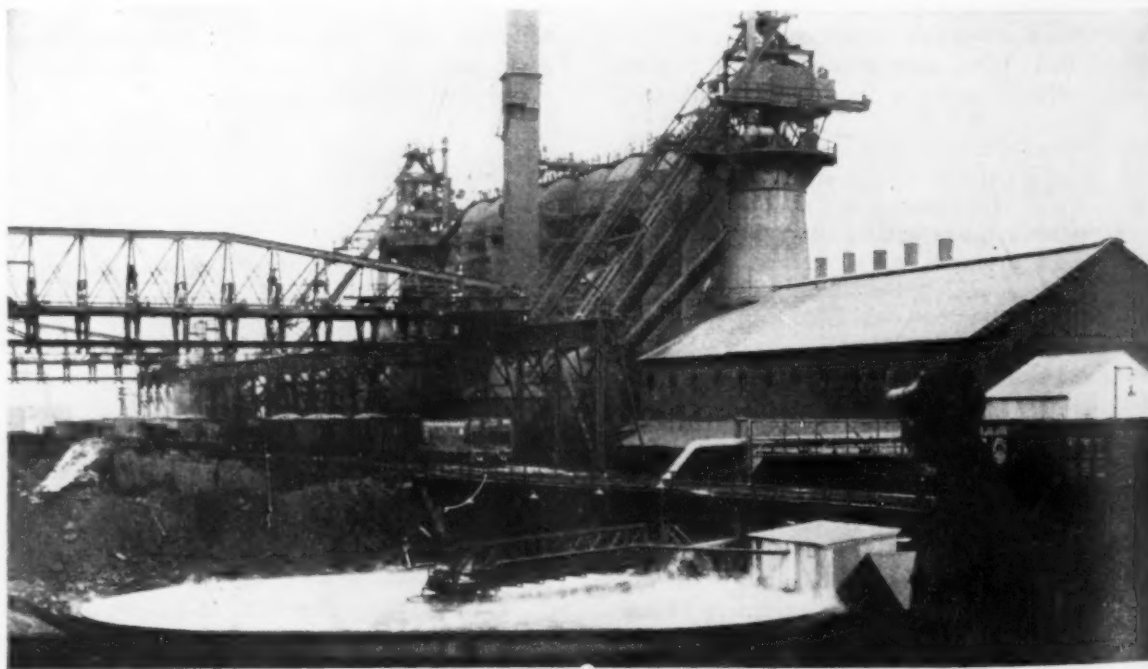
burners for each boiler have also been included.

Gas produced by the two furnaces is now cleaned by two 75,000-cfm gas washers. The system is flexible so that either washer can process gas from both furnaces. This arrangement allows ample cleaning capacity so that bleeding of raw gas into the atmosphere is not necessary.

Water for the washers is supplied by a newly-constructed pump house at the rate of 4500 gpm. A bottom cone in each washer is flushed by a 16-in. quick-opening valve as two 16-in. pipes carry away the sludge and overflow water. Dirt and water from the sump and overflow pipes are then carried by gravity through a 24-in. pipeline to the thickener. It consists of steel tank shell 90 ft in diameter and 9 ft deep constructed on a concrete bottom. It handles wash water at an average of 6300 gpm. Overflow water returns to the river and sludge is pumped to the filter house.

Sludge is processed at the filter house by a disk-type continuous filter with wedge-shaped sectors covered with a cloth filtering material.

The revolving disks then pass through the scrapers for thorough cleaning. The filter cake is now ready for sintering and re-use in the blast furnace.



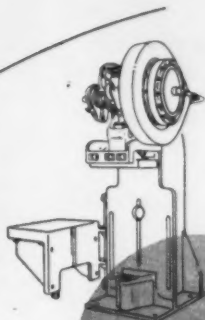
PART OF GAS CLEANING SYSTEM is this 90-ft thickener which processes wash water at the rate of 6300 gpm.

Settled sludge containing 45 to 50 pct solids is recovered for sintering.

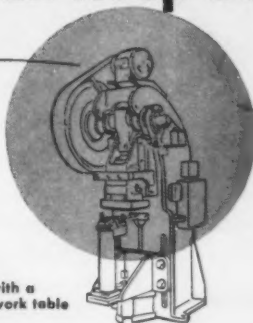


# A Multi-purpose Press You Can Keep Busy All the Time

Used as a standard  
gap-frame press



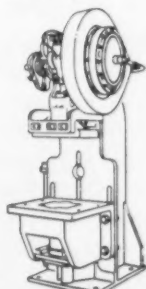
Used with a  
traversing work table



For regular horn  
press operations



As used with  
special feeding device

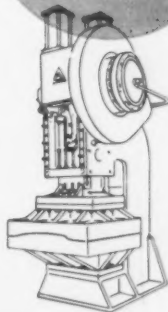


As used with a  
die cushion

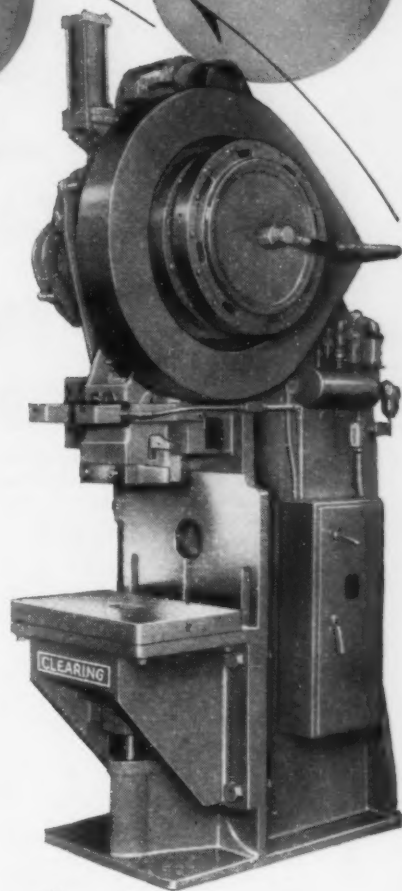
Clearing horning presses, properly tooled, are the most versatile machines available for the variety of operations performed in many stamping plants. These machines lend themselves to being equipped with special bolsters, work tables and feeding arrangements—getting peak production on both special and standard jobs. Find out about Clearing horning presses and special attachments that will be exactly right for your production.

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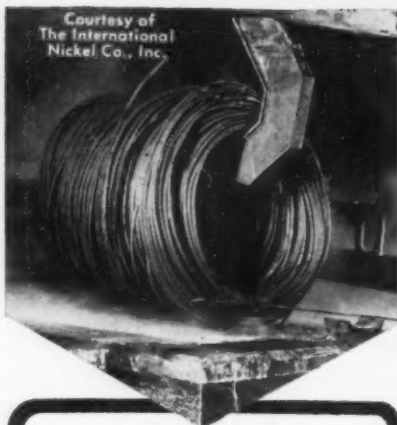
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This outstanding Nopco chemical also assures other important advantages, such as:

- reduced operating time because Nopco 1067-A shortens the pickling cycle—steps up bath activity. Gives faster, more uniform penetration of oxide scale.
- lowered costs and easier acid disposal—since better drain-off means fewer rinsings. Acid is localized in first tanks.
- reduced acid contamination in operations following pickling—with the result that tool and die life are increased.

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## Technical Briefs

Engineering

### SAFETY:

Lighter weight respirators find wider employee acceptance.

Getting employees to use respirators when and where they need to is a common problem in many industries. Typical of excellent policy and practice on this score is Richmond Radiator Co., Monaca, Pa. Men are required to wear respirators in certain operations and encouraged to wear them elsewhere, at individual option. Respirators are maintained effectively on a cooperative basis.

Health hazards have been reduced or eliminated because employee attitude towards the use of respirators has been excellent. This keynotes a plant safety program which in all its phases is



FINISH GRINDING of castings is done by hand to give best results in finished porcelain enameled product.



SLUSHING OPERATIONS, application of ground coat of paint prior to porcelain enameling, also requires operators have efficient respiratory protection.

### IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 123. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

considered by everyone as "everybody's job."

Major product of the Monaca plant is porcelain enameled cast iron plumbing fixtures, from casting through finished units. Because of the widespread notion that "if you work in foundry you need respiratory protection," respirators are provided for those who wish to wear them in foundry operations. Several other jobs, such as grinding, slushing, and chemical-weighing require use of respirators.

Respirators are worn on individual option, in the shake-out operation of this foundry. For swing grinding and other hand grinding company safety policy requires respirator wear.

### Where Not Used

Respirators are not required for the shotblasting operation which precedes the first (swing) grinding, because this is an entirely automatic phase that involves no human participation. Conveyors carry the castings into and out of the shotblast booth.

Men doing the slashing—application of a water-base primer coat to the bare iron castings, prior to vitreous enameling—must wear respirators.

### Mixing and Handling

In the weighing operation, which involves mixing and handling of chemicals such as feldspar, this respiratory protection also is required.

An MSA Dustfoe No. 55, a (2-3/4 oz), compact respirator is used for maximum visibility and to provide efficient filtering of dusts.



## CASTINGS:

Defense demands for Ni, Cr put squeeze on furnace castings.

New alloys and wider use of alloys with low nickel and chromium content are ahead for makers and users of heat resistant castings, E. A. Schoefer, executive vice president, Alloy Casting Institute, recently told Industrial Furnace Mfrs. at Hot Springs, Va.

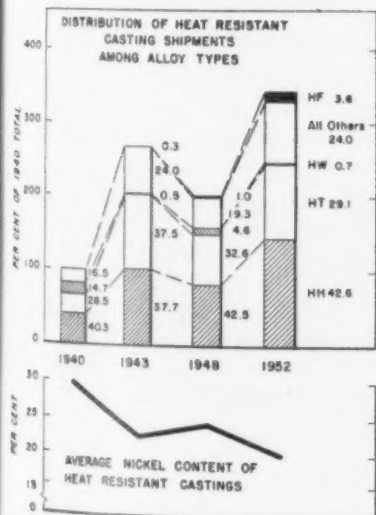
The trend, started during World War II, could easily be accentuated by emergency defense needs. With the development of jet engines and guided missiles, enormous amounts of nickel and chromium will be flown and blown away, Mr. Schoefer stated.

### Alloy Content Down

Outlining the trend to castings with lower nickel-chromium content, Mr. Schoefer pointed out that in 1940 over half of all heat resistant castings contained from 35 to 68 pct Ni, and most of the remaining output was concentrated in HH type castings with 25 pct Cr, 12 pct Ni.

HW type castings, about one sixth of the total, contained 60 pct Ni. HT castings, with 35 pct Ni, accounted for slightly less than one third of total production.

Denied the high-nickel castings

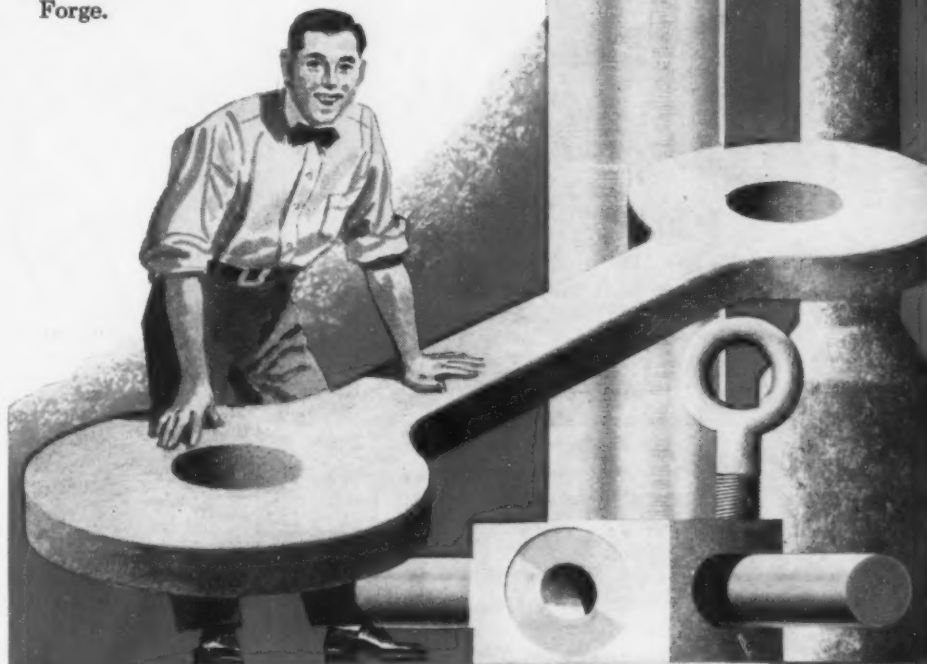


AVERAGE NICKEL CONTENT of heat resistant castings is steadily declining from the 1940 high point. Heavy defense demands for nickel and chromium in metals will probably keep trend going down.

Turn Page

## need a forge shop in your plant?

Here it is—not a shop packaged and ready for delivery, but a shop operating at full tilt for firms such as yours. Ours is the kind of forge shop that best complements your operation . . . we can make you shafts, pinions, large or small U-bolts, anchor bolts, spanner wrenches, hex and square head large bolts, and a multitude of other special forgings that are custom-made. All of the parts you see here were "emergency" forgings that had to be made with the speed and efficiency necessary to keep some phase of some plant operating. It will pay you to remember . . . for custom forgings, think first of American Forge.



# American Forge and Manufacturing Co.

820 Shore Avenue • Pittsburgh 12, Pa.

Forged shafts • pinions • gear blanks • steel rings • connecting rods • discs • heavy bolts up to 6" dia. • 5 to 100 ton capacity mill hooks • ratchets • load binders • hand and automatic tongs to your specifications

"Forgings for Industry since 1890"





## How CONE-DRIVE gears improve your equipment



You can be sure, if the equipment you purchased is operated through Cone-Drive gears or speed reducers, that the manufacturer is giving you "the best."

The secret of Cone-Drive gears and speed reducers is their double enveloping action. Double enveloping—the worm wrapped around the gear, the gear wrapped around the worm—means far greater load capacity for a given gear size, amazing smoothness, greater shock load capacity, far longer life expectancy and trouble-free operation.

Ask if the equipment you buy has double enveloping Cone-Drive gears or speed reducers if you, too, want "the best at the lowest cost."



Standard double-enveloping Cone-Drive gearsets and reducers have greater contact per tooth, more teeth in contact, increased load capacity, greater shock load capacity, longer life, lighter weight—and lower overall cost.

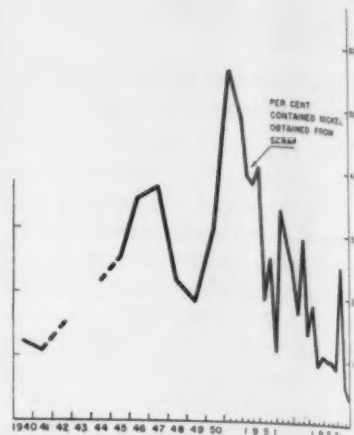
For information on use of Cone-Drive gears and reducers in your field, ask for Bulletin No. 789-50.

### CONE-DRIVE GEARS

DOUBLE ENVELOPING GEAR SETS & SPEED REDUCERS

Division Michigan Tool Company  
7171 E. McNichols Road • Detroit 12, Michigan

## Technical Briefs



LESS THAN 10 PCT of the nickel contained in heat resistant castings was obtained from scrap by end of 1952. Decline points to wide need for suitable nickel-containing scrap.

they were accustomed to, many users found they could live with lower nickel content castings. Present as well as past ACI research projects are aimed at studying alloys in the iron-chromium-nickel group with an eye to best hot gas corrosion resistance and high temperature mechanical properties.

The desperate need for suitable nickel-containing scrap, Mr. Schofer pointed out, has gone hand in hand with use of low alloy castings. The downtrend in nickel-bearing scrap continued through 1952. At year end, only about 10 pct of the Ni contained in shipped castings was being obtained from scrap.

### Electric Weld Tube Mill Versatile

A new and highly compact electric weld tube mill has been developed by Herr Engineering Co., Warren, Ohio, to produce a wide variety of sizes and types of tubing. The mill forms flat stock, welds the joint, burrs the seam, and sizes the tube in one continuous operation. It has ten roll passes, six in the forming section and four in the sizing section.

Compactness is an outstanding feature of the new mill. An extremely short center distance, 11¼ in., between roll stands greatly reduces the overall length of the mill. This is made possible through use of Cone-Drive double enveloping gearing—which permits the carrying of higher loads on smaller center distances—in the ten speed reducers used in the drive system.



## JIGS AND FIXTURES:

Costs for temporary tooling go down with "building blocks."

Costs of temporary tooling are down and substantial savings in time and money are being achieved through the use of an industrial "Erector set" by the General Electric Co.'s J-47 jet engine plant at Evendale, Ohio.

### Tools From Blocks

The Wharton system consists of a set of approximately 450 basic pieces which are used to assemble jigs and fixtures for machining and assembly work. These jigs and fixtures are used in drilling, reaming, tapping, milling, and many other metal working processes in the manufacture of jet engine parts.

The set is composed of interlocking blocks, clamps, bolts, bushings, and other parts which can be assembled in an almost infinite number of combinations.

By using the 'Erector set' principle, a British invention called the Wharton Universal jig and fixture system, a considerable saving can be made by having toolmakers quickly assemble dependable 'temporary' tooling to almost any design.

When the job is completed, the tooling can be disassembled for use on another part. As a result, money is not invested in permanent type tooling for short runs.

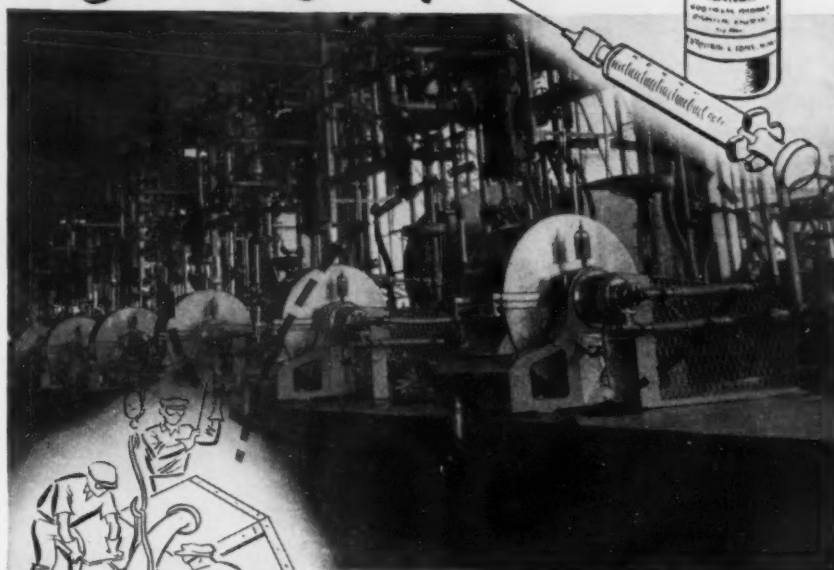
Formerly, most design changes would have involved making complete new fixtures.



INDUSTRIAL BUILDING BLOCKS are used to make up jigs and fixtures as needed. Set contains 450 interlocking blocks, clamps, bolts, bushings and other parts for fast "temporary" tooling.



Turn Page


# In lengthening your life span...



**LEBANON**  **Castings**  
*are at work*

**M**AKING penicillin and other antibiotics requires carefully engineered equipment. From this assortment of vats and filters, piping and valves come "wonder drugs" that lengthen your life span.

E. R. Squibb & Sons Laboratories at New Brunswick, New Jersey, make these vital antibiotics. Here Squibb uses special automatic process control equipment made by the Fischer & Porter Company that includes many Lebanon CIRCLE  castings. To maintain the "Reliability, Uniformity, Purity and Efficacy" of these Squibb products, each CIRCLE  casting must be thoroughly sound and unaffected by the concentrated caustic and sulphuric acids present in the manufacturing process.

In difficult services, services where perfection in material and workmanship are demanded, Lebanon CIRCLE  castings have established remarkable records.

You should see—STEEL WITH A THOUSAND QUALITIES—37-min. 16 mm. full-color sound film on the making of steel castings. For information write: Dept. A, Lebanon Steel Foundry.

**LEBANON**  **Castings**  
CARBON, SPECIAL ALLOY  
AND STAINLESS STEEL

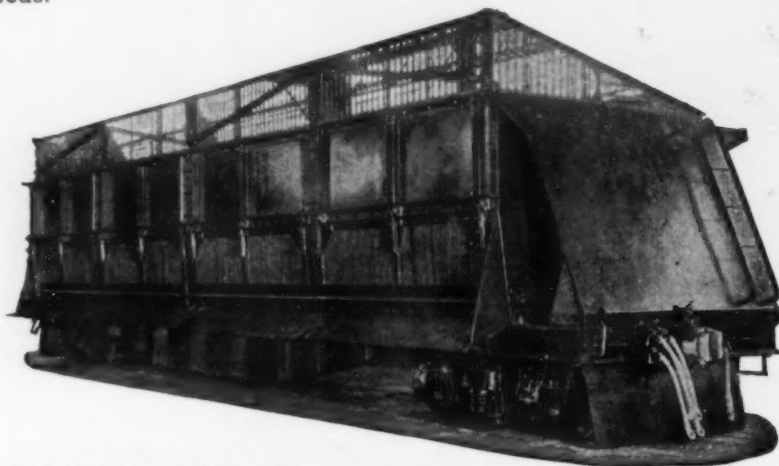
LEBANON STEEL FOUNDRY

LEBANON, PA.



# 50 Years of KNOW-HOW

For more than 50 years Atlas has been designing coke oven machinery of acknowledged excellence. Coal Charging Cars, Coke Quenching Cars, Door Extractors and Coke Guides *must* be built with "know-how" to produce best operating results and lowest maintenance. Let Atlas quote on your needs.



**COKE QUENCHING CAR**

The latest Atlas Quenching Cars have longer life with lower maintenance than previous types. Their cost also is lower. This is due to the welded "corrosion-resisting" frame of heavier material with fewer joints and all joints weld-sealed together with the use of abrasion resisting floor plates, which outwear cast plates and cost much less to replace. There is no welding on Atlas abrasion resisting floor plates. The improved door operating mechanism is sealed against the entrance of coke dust and water and is simplified to eliminate the troublesome line shafts. Coke deflectors are provided at each end. Air hoses are armor-clad. Gates generally are of steel bars arranged for easy replacement. Cars are supplied with or without upper racks.

**Custom Builders of Coke Oven Equipment**



**THE ATLAS CAR & MFG. CO.**

ENGINEERS

MANUFACTURERS

1140 IVANHOE RD.

CLEVELAND 10, OHIO, U. S. A.

## Technical Briefs

### NEW ALLOY:

High temperature metal developed to meet unusual needs.

High temperature operation conditions encountered in aircraft exhaust systems have led to development of a new alloy by Ryan Aeronautical Co., San Diego. The alloy is especially designed for high heat and corrosion resistance.

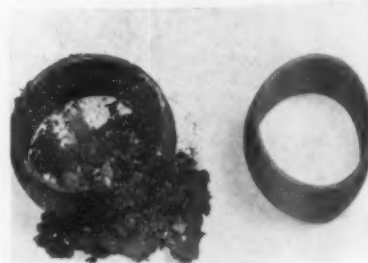
Christened "Rynalloy" the alloy is designed for service at temperatures up to 1800°F with ball-and-socket joints. A patented Ryan device, the ball-and-socket joints are the most successful means for imparting complete flexibility to aircraft exhaust systems.

### Isolate Vibration

Fabricated in sizes from 1¼ to 5 in. in diam, ball-and-socket joints consist of three parts. The "ball" is actually a spherical section with a cylindrical bore through it. It is retained in a stainless steel tube flared into a close fitting cup at one end. Within the ball, another tube is inserted and flared to form a snug fitting assembly which permits the connecting tubes to slip, twist and rotate with universal action. As many as 56 ball-and-socket joints are used to isolate the terrific vibration of huge power plants in aircraft.

### Proves Stamina In Use

Components of the ball-and-socket joint must fit together closely with a large area of metal-to-metal contact. In service, the metals rub together constantly due to the vibration and thermal movement. At the extreme tem-



PROPERTIES of the alloy are demonstrated in this view of a Rynalloy ball, right, and a competitive alloy, left, which have been exposed to 1650°F for 100 hr.

Turn to Page 176





**This joint must carry water at 500°F and 1600 p.s.i.**



## **RADIOGRAPHY says the weld's sound**

**T**o gain top efficiency, modern power plants are operating at higher pressures and higher temperatures—conditions which call for utmost dependability in the welded joints of the piping.

Here radiography is invaluable; it alone can prove the soundness of the welds.

In this way radiography has opened new fields to welders. In high pressure piping, in the manufacture of pressure vessels, and in

other applications where welding was once banned, it is now an accepted procedure.

Radiography can help you build business as well as earn a reputation for highly satisfactory work.

If you would like to know more about what it can do for you, talk it over with your x-ray dealer.

**EASTMAN KODAK COMPANY**  
**X-ray Division, Rochester 4, N. Y.**

## **Radiography . . .**

**another important function of photography**

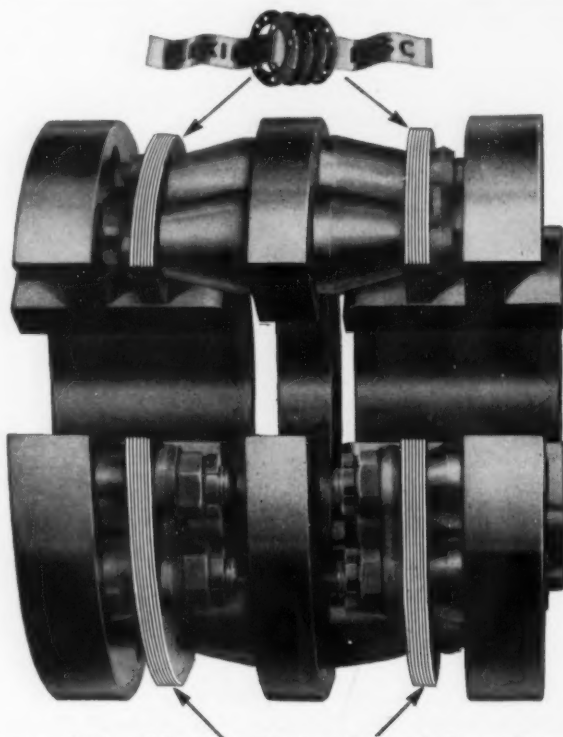




# AVOID COSTLY SHUT-DOWNS!

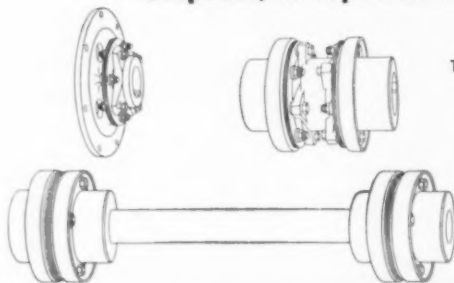
Specify THOMAS Flexible Couplings for Power Transmission

DISTINCTIVE ADVANTAGES of THOMAS ALL-METAL COUPLINGS	
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
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CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



**Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.**

**Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes.**



THE THOMAS PRINCIPLE GUARANTEES  
PERFECT BALANCE UNDER ALL  
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MANUFACTURERS OF  
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FOR OVER 35 YEARS

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**THOMAS FLEXIBLE COUPLING COMPANY**  
WARREN, PENNSYLVANIA, U.S.A.

## —Technical Briefs—

peratures experienced no lubricant can be provided.

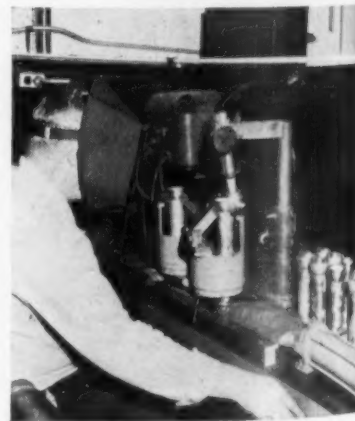
Under these conditions most cast metals will oxidize to form a scale which accumulates. Consequently, first requirement of the ball joint alloy is good resistance to oxidation at elevated temperatures.

Of these needs, and with suggestions from International Nickel Co., Rynalloy was born. The new metal has been used in Ryan ball-and-socket joints for one year and has proved to have the stamina required. In arriving at its final formula a number of trends were observed.

The coefficient of thermal expansion which must match that of stainless is determined by the amount of nickel contained in the alloy. It was found that a nickel content of 20 pct provided the correct thermal expansion. If the nickel component is less than 13 pct, hard martensitic irons are obtained which reduce ductility and exhibit large volume changes upon heating and cooling.

### Alloy Content Critical

Investigations showed that amounts of chromium should not be less than 1.8 pct and that it is desirable to obtain compositions with more than this amount because the presence of this element increases oxidation resistance and refines the graphitic structure. On the other hand, too much chromi-



FAST HELIARC WELDER and Ryan-designed revolving fixtures are used to attach Rynalloy balls to stainless steel tubes in a few seconds.

Turn to Page 178





# One plating shift does the work of Two

Here was a plant that was hard chromium plating airplane parts to increase resistance to wear and corrosion. But the deposit being obtained was rough. They either had to take at least 4 1/4 hours to deposit the .004" thick chromium smoothly, or else do excessive grinding and polishing. This slow rate meant running over to a second shift to meet schedules.

But they found another alternative upon consulting United Chromium.

"The Unichrome Man" suggested an easy change-over from the ordinary solution to the Unichrome SRHS Chromium Solution. In over 700 commercial installations, this bath had demonstrated it virtually obsoletes chromium plating by any other methods. It plates a more level deposit 20% to 80% faster.

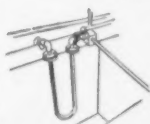
Result: The SRHS Solution produced a smoother .004" plate in only three hours—saving enough time to meet schedules in one shift instead of two.



## NOW IT

- TAKES 1 1/4 HOURS LESS TO PLATE
- HAS A BETTER CHROMIUM FINISH
- SAVES GRINDING AND POLISHING

### MORE WAYS UNITED CHROMIUM HELPS TO SAVE ON COATING OF METALS



#### Paid for themselves.

New England concern found that 2 Unichrome Tantalum Heating Coils in chromium bath had paid for themselves in 1 year by eliminating repair of former type of coils, and production loss. Now every additional year pays a bonus.



#### Saves \$25,000.

Tubular furniture manufacturer was able to use Unichrome Copper Plating Process in idle, rubber-lined nickel plating machine without alteration—thereby saving \$25,000 installation cost.



#### Low Cost chromate finishing.

The Anozinc® process means more economical mass production of uniform protective finishes on zinc plate. On a run of 26,000 shell cases, for example, one company got only 84 rejects. \*Trade Mark

TO FINISH IT BETTER  
AND SAVE  
call in "The Unichrome Man"

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### It pays to consult United Chromium on Metal Finishing Problems

United Chromium offers you the advantages of: (1) 25 years of specialized experience in metal finishing; (2) Wide experience in both organic and plated finishes; (3) A diversified line of products for decorative and functional finishing—including plating processes, protective coatings, chemical conversion coatings for zinc; (4) Thinking geared to cost-cutting, product-improving possibilities.

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June 18, 1953



# SHENANGO *Centrifugal* CASTINGS ... KEY TO SAVINGS



FROM TINY LINERS TO HUGE ROLLS  
**double assurance**  
OF LONGER LIFE!



**F**OR close-knit strength and added life, here's a combination you just can't beat—Shenango centrifugally cast parts of Meehanite Metal. It is *double assurance* of finer, more uniform, pressure-dense metal, plus freedom from blow holes, sand inclusions and other defects!

So check with Shenango on your

need for symmetrical or annular parts—semi-finished if you wish, or machined to your precise specifications in the modern Shenango shops. Get *all* the facts. Like others you'll probably find you can save time, money and trouble.

## SHENANGO-PENN MOLD COMPANY

Centrifugal Castings Division

Dover, Ohio

Executive Offices: Pittsburgh, Pa.

# SHENANGO

ALL RED BRONZES • MANGANESE BRONZES • ALUMINUM BRONZES  
MONEL METAL • NI-RESIST • MEEHANITE METAL

## Technical Briefs

um hardens the iron and lowers machinability.

Silicon is also used because its addition increases high temperature strength and oxidation resistance. Amounts in excess of 6 pct are detrimental because silicon then affects ductility and machinability.

The percentage of carbon contained is limited to 2.5 pct and the less carbon the better the strength and temperature resistance obtained. Graphitic carbon, deposited along the grain boundaries of the metal, is necessary to provide anti-galling characteristics.

### Sulfur Restricted

Other elements are present in small amounts but their quantities can affect the alloy's properties in a definite manner. Sulfur is undesirable and should be restricted to the lowest possible amount.

Manganese acts like nickel in making the alloy austenitic but it possesses the undesirable property of reducing resistance to scaling. It should be present in quantities sufficient to counteract whatever sulfur is contained but not above 1 pct. Because phosphides in iron melt at 1760°F, greatly reducing metal strength, phosphorous should be maintained at the lowest possible proportion.

Rynalloy balls are sand-cast at about 2350°F with a dimension which is 1/16-in. oversize to allow for machining. They are machined, inside and out, to a finish of 100 rms and dimensional tolerances are held to 0.002 in.

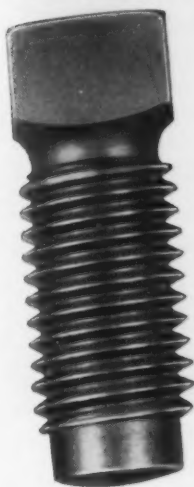
### Keep Tabs On Well Drilling

An automatic recording device which can be lowered into even the deepest oil wells has been developed by the Petro-Mechanics Research Div. of Borg-Warner Corp. It forms part of a conventional drill string, and records forces on various parts of the drill. The device measures the impact resulting from the contact of the drill and the formation, and also records temperatures, stresses, pressures and mud velocities.

Turn to Page 180



Set screw for  
coal-cutter chain



**TOUGHNESS!**

Fan shaft and  
oil impeller for  
automobile  
water pump



**HARDNESS!**

Socket for mechanic's  
socket wrench



**STRENGTH!**

## Each Achieved With the Right REPUBLIC COLD DRAWN ALLOY STEEL BARS

Here are examples of alloy steel parts made by Republic customers. Each was searching for a certain outstanding characteristic . . .

One wanted the edges of a set-screw for a coal-cutter chain to be tough enough to resist rounding off when dragging through a coal seam deep in a mine . . .

The next one wanted an automobile water-pump shaft hard enough to resist thousands of miles of high-speed service without becoming worn and leaky . . .

The third wanted a socket-wrench with a socket that was stronger than the heaviest-handed mechanic . . .

All three manufacturers called in the Republic

Field Metallurgist . . . discussed their three different problems with him . . . got a triple-distilled alloy-choice that was part his, part the Republic Mill Metallurgist's, part the Republic Laboratory Metallurgist's.

Each customer is using a different Republic Cold Drawn Alloy Steel Bar grade . . . all three got the high surface quality, the close dimensional tolerance, the high strength, and the UNIFORM MACHINABILITY that helped cut production costs, increase tool life, improve product quality.

Want to try Republic 3-Dimension Metallurgical Service on *your* production problems? A call to your Republic District Sales Office will start action.

### REPUBLIC STEEL CORPORATION

*Alloy Steel Division • Massillon, Ohio*

GENERAL OFFICES • CLEVELAND 1, OHIO  
Export Department: Chrysler Building, New York 17, N. Y.

...combines the extensive experience and coordinated abilities of Republic's *Field, Mill* and *Laboratory* Metallurgists with the knowledge and skills of your own engineers. It has helped guide users of Alloy Steels in countless industries to the correct steel and its most efficient usage. IT CAN DO THE SAME FOR YOU.



**3-DIMENSION**  
Metallurgical Service

*Republic* COLD DRAWN  
**ALLOY STEEL BARS**







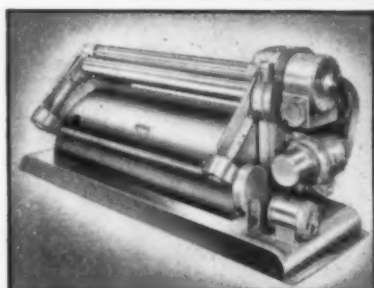
## Modern Metalworking Equipment

- BENDING ROLLS
- TURNING ROLLS
- AUTOMATIC WELDING FIXTURES



### REED WELDING POSITIONER

- ★ Machined face with cast-in "T" slots
- ★ Machine Tool accuracy
- ★ 10-to-1 speed variation
- ★ Ball bearing work table mounting
- ★ 1000, 2500 lb. models, hand or power tilting
- ★ Rotating ground connection



### REED PLATE BENDING ROLLS

- ★ In 18 models, ranging from 3 ft. x 10 ga. to 8 ft. x 1/4" in capacity
- ★ Rugged, all steel construction
- ★ Built-in, silent worm gear drive
- ★ Durable, special bronze bearings
- ★ Power adjustment & air drop end available on most models

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to write us for specifications, prices,  
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gation. Just write on your letterhead.

## REED ENGINEERING CO.

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## —Technical Briefs—

### COMPUTERS:

Simulator trains Navy pilots  
with complete realism.

Men and machines are being trained with complete safety by the Navy using a new electronic flight simulator. The P2V-5 flight simulator provides a safe, economical method of training pilots and copilots to fly the long range flying arsenal. The unit was designed and built for the Special Devices Center, Office of Naval Research, by Engineering and Research Corp., Md.

Electronic simulators provide an illusion of flight complete to passing clouds and lightning.

### Pilot "Hears, Feels" Plane

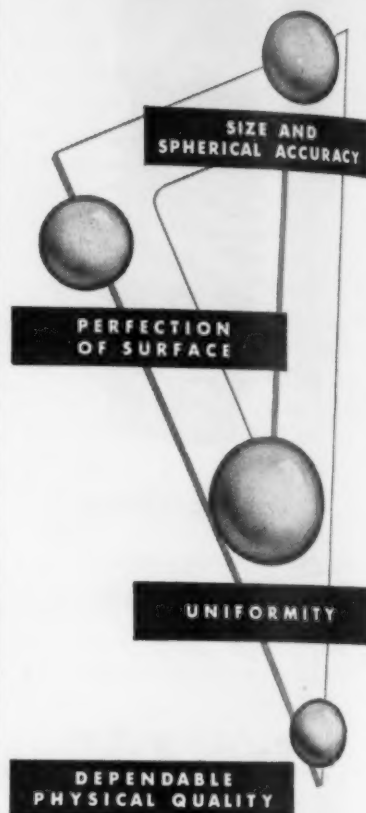
The pilot hears engine and propeller noises, feels the airplane bouncing under him when flying through rough air, feels the slipstream reacting on his controls, listens to radio beacons, talks to the tower by radio, and hears static on his radio as lightning flashes outside his windows.

Structural vibration, realistically varying in frequency and amplitude, makes the trainer feel "alive," adding greatly to the psy-



COMPACT ARRANGEMENT of instruments, controls and indicator lights is a feature of this air-conditioned trailer housing P2V-5 electronic flight simulator. At the controls is Jean Mroz, engineering secretary, receiving instruction from Lt. Frank Nelson, Korean combat pilot.

from any angle



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## Technical Briefs

chological impact. Veteran P2V-5 pilots who have "flown" ERCO's simulator have been unanimous in their enthusiasm for the new trainer, and were amazed to find that even the characteristic propeller "chirp" at idle speeds was included.

### Done With Computers

The simulators are basically electronic computers in which all the forces acting on the airplane in flight, including the pilot's control forces, are considered as items in a number of equations.

Computers solve these equations instantly and continuously, and the answers provide instrument indications identical to those of the aircraft. This type of simulation is far more complete and faithful than the types formerly in use, for it is derived from the fact that airplanes follow definite physical laws and mathematical equations which can be solved by servo-mechanisms.

### Saves Men, Planes

Pilot errors and marginal maneuvers, such as engine failure on take-off, which might endanger an airplane can be performed safely in the simulator. By observing the effects of the maneuvers on the performance of the simulator, the student-pilot can learn the full capabilities and limitations of the airplane.

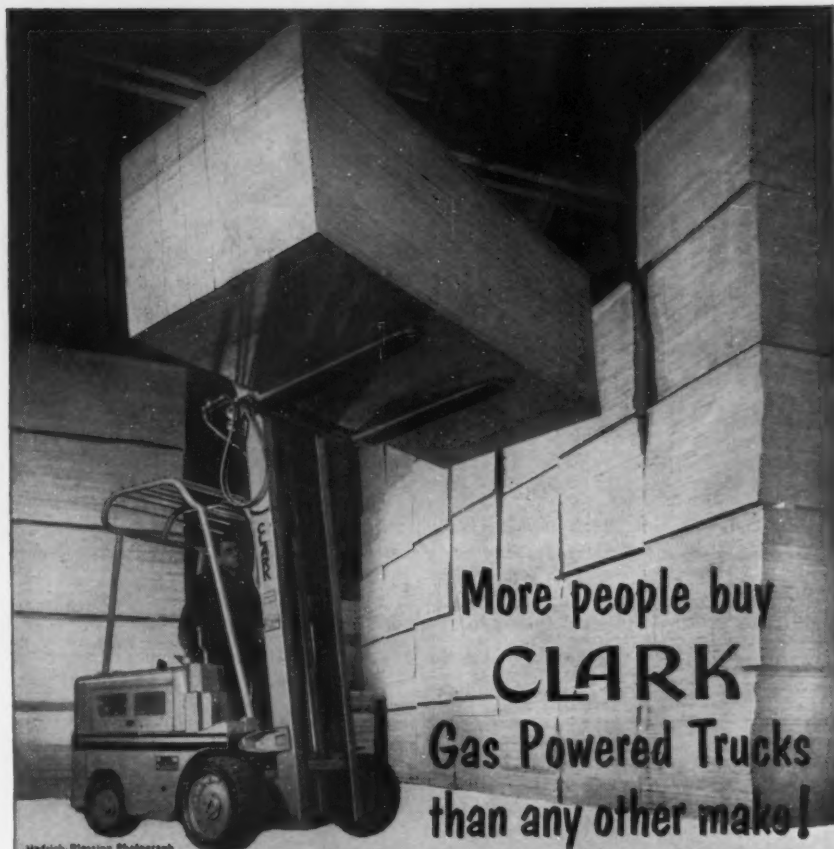
### Resin Makes Castings Oil Tight

A fully automatic process for sealing porous aircraft engine castings with liquid synthetic resin has been put into operation in Pratt & Whitney Aircraft branch plants at Southington and North Haven, Conn.

Believed to be the first of its kind in any industry, the operation makes aluminum and magnesium castings oil-tight through vacuum-pressure impregnation.

After being cleaned, castings up to 80 in. in diam are placed in 1500-gal autoclaves under 28-in. vacuum to eliminate air pockets. A resin, 3255 Permafil, is introduced and light pressure.

Turn Page



Hedrich-Blossing Photograph, courtesy of the EDWARD MINES LUMBER CO.

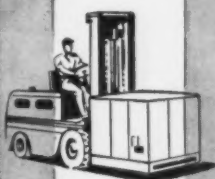
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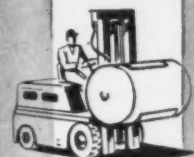
**CLARK Horsepower Is Capacity-Rated To Your Requirements**—Why pay for excess horsepower that you'll never use? CLARK gives you five engines, rated according to truck capacity. You get plenty of power for the job, without a lot of gas-consuming excess. When you buy a CLARK in the size that's right for you, you get the proper horsepower, too.

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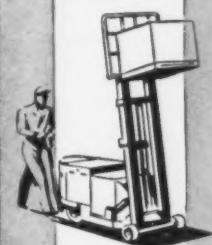
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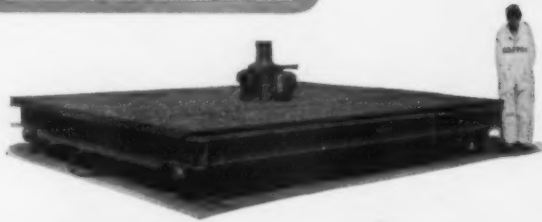
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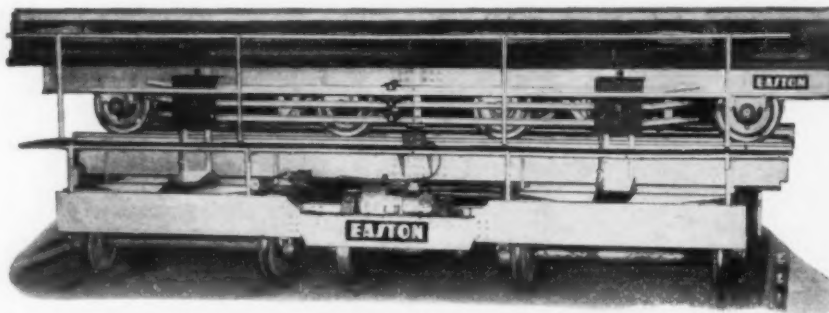
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**"READING" CRANE'S accurate spotting speeds handling of heavy loads...**

To reduce handling costs and improve production, a fast, efficient 5-ton "Reading" electric crane replaced the slow-moving hoist formerly installed in the plant pictured here. This "Reading" double I-beam, floor-operated crane has a traveling speed of 150 feet per minute—and a 22' lift.

Used to lower heavy domes on their heat treating furnaces, the new crane turns a tedious, costly handling job into a swift "push-button" operation. Worker fatigue is lessened. Shutdown time is reduced. Load handling costs are cut to the bone.

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## READING CRANES

## —Technical Briefs—

### BERYL RECOVERY:

New flotation process will permit use of low-grade ores.

A new laboratory pilot plant for recovery of beryl, a rare and critical mineral with many military and industrial uses found in South Dakota's rich Black Hills, will begin its first test run today in the Pegmatite Research Laboratory of the U. S. Bureau of Mines, Dept. of Interior, Rapid City.

Procedure for the flotation of beryl which will be tested in the laboratory-scale pilot plant was developed by S. M. Runke, Bureau of Mines metallurgist. The plant can treat 100 lb of crude pegmatite an hour by continuous flow of the ore through all stages of beneficiation.

### Could Replace Hand-sorting

While the current research is primarily concerned with recovering a satisfactory beryl concentrate, it also will permit research on the separation of mica, feldspar, tantalite, columbite and numerous other minor but very valuable minerals found in pegmatite.

No method has been developed for commercial use which will permit the winning of all the essential minor minerals within pegmatite rock.

If pilot plant tests prove as successful as laboratory tests have indicated, the Bureau method could eliminate the great waste that results from hand-sorting and discarding the fines—the most common way of obtaining pegmatite minerals for industrial use.

### Use Low-grade Ores

Laboratory tests at Rapid City have indicated that ore as low as 0.1 pct beryl can be successfully concentrated with a recovery of 85 pct.

In the process, non-lithium berylliferous pegmatite materials are ground to a desirable size for flotation, the material is deslimed to rid it of interfering fines and the mica is removed. This is followed by bulk flotation of the beryl and feldspar minerals, and



the separation of the beryl from the feldspar.

Tailings from these operations, generally quartz containing cassiterite, tantalite and columbite, can be recovered by simple gravity concentration methods.

#### Use Growing

Beryl is used directly in the manufacture of porcelains for spark plugs. Beryllium oxide goes into making special purpose refractories and into copper-beryllium alloys which in turn make excellent springs, electrical contact points, nonmagnetic ball bearings and nonsparking tools. Beryllium, the metal, is used in X-ray windows and in the atomic energy field as a moderator of fast neutrons.

#### Rely On Imports

With domestic production small, the United States relies on imports for about 90 pct of all beryl consumed. In 1950, imports totaled 4683 short tons valued at \$1,181,831. They came from Brazil, The Union of South Africa, South-West Africa, Southern Rhodesia and Mozambique.

#### RHODIUM COATINGS:

Vacuum equipment hastens use of rare metal on many materials.

Rhodium is one of the most infusible of metals. Pile atop that the metal's extreme hardness, 775 to 820 Vickers, and its high resistance to acids, and you've got one of science and industry's most valued rare metals.

Use of rhodium for more than fountain pens has grown gradually. But development of improved vacuum equipment seems to be hastening industry applications of rhodium coatings to nonconductive and conductive materials.

#### Controlled Coating Thickness

The rare metal is being applied on a commercial basis upon glass and other non-conductive substances to meet specifications of transmittancy and hardness.

Rhodium's high resistance to

Turn Page

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Uniform strength, accurate dimensions and high ductility are three of the many qualities found in Murray boiler tubes. Welded or seamless tubes in sizes ranging from  $\frac{5}{8}$ - to 8-inch OD are available for immediate shipment from warehouse stocks.

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Other Murray products include carbon and stainless steel tubing and pipe for pressure and mechanical purposes; welding and screw type pipe and tube fittings. Tube bending, upsetting, swaging.



## —Technical Briefs—

chemical attack and high reflectivity make it excellent for mirrors and reflecting surfaces when they must withstand corrosive chemical atmospheres. Coating thicknesses can be applied to give controlled reflectivity or transmittancy within 5 pct.

### Typical Uses

Serfass Corp., of New Haven, Conn., is applying rhodium as well as other metals that can be vacuum deposited, such as aluminum, gold and silver. Serfass works on a job basis.

Some objects coated are glass, microscope slides for analysis of blood, mirrors for optical apparatus, reflectors for telescopes, glass go and no-go gauges, and glass bearing surfaces.

### Wear Resistant

Rhodium coatings when deposited upon glass and are subjected to baking become extremely hard, and the coating, therefore, is ideal for making thin hard surfaces to resist wear or friction. In addition to the vacuum coating facilities, Serfass is equipped to measure reflectivity, porosity and transmittance of coatings.



MORE OF THE RARE metal rhodium is being used for specialized applications coating applications since development of vacuum equipment such as that shown above.

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## Technical Briefs

### MATERIALS HANDLING:

Hydraulic rams, conveyors speed movement of coils in process.

Coil handling equipment conveyor at the U. S. Steel Sheet & Tin Mill in Gary, Ind., is illustrative of the growing role that fluid power is playing in the movement of heavy materials efficiently and economically.

Large, heavy coils of sheet steel are pushed, tilted, lifted and pulled down a conveyor line by means of seven special, long stroke Lindberg Air & Hydraulic Cylinders for final positioning on three gravity conveyors leading to the entry end of the pickle lines.

Coils range in size from a minimum of 30 in. in diam by 2 ft high to 4 ft 6 in. in diam by 6 ft 2 in. high and weigh up to 25,000 lb.

#### Powered Conveyor

Cranes lift the coils from the storage area in the raw coil pickling department and position them upright on a powered conveyor leading to a turn table. Due to the varying sizes of the coils, an operator turns the table until the coil fits snugly against the pusher head of a mill type air cylinder (A) with a 16 in. bore x 72 in. stroke.

This cylinder pushes the coil on to a powered conveyor that carries it to a point where a 2000 psi hydraulic cylinder which operates in conjunction with a special tilting mechanism to tilt the coil on its side.

The coil now at rest on a dolly at the end of this conveyor is lifted a few inches by a pendulum mounting



MILL TYPE AIR cylinder has a 16-in. bore, 72-in. stroke and can move coils weighing up to 25,000 lb.

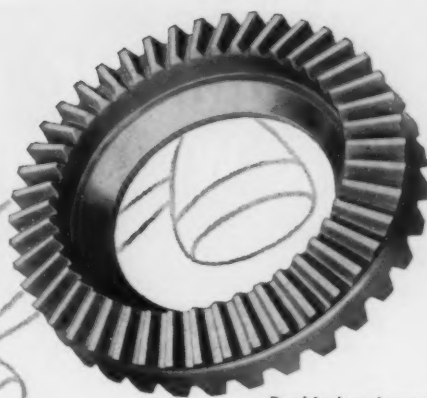
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We are proud of our craftsmen, proud of our gears, proud of our reputation for quality. And we are proud of the fact that our customers can deal with us with complete confidence—an established, reputable firm with whom you, too, will enjoy working.

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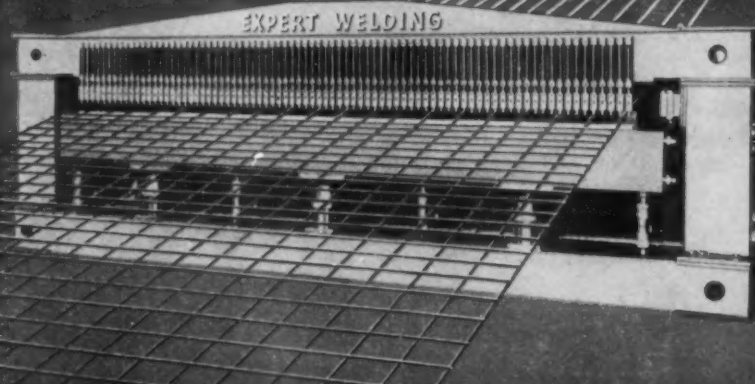
Producers of fine tool steels—High Speed Steels  
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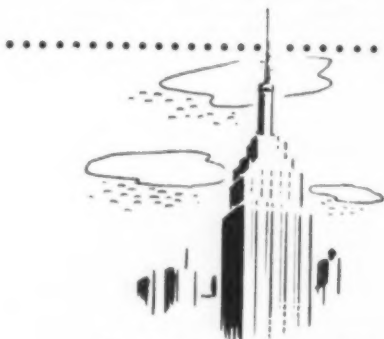
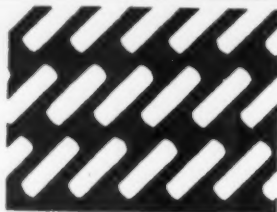
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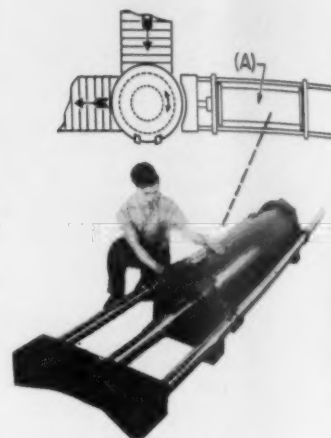
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## —Technical Briefs—



ONE OF THE BIG air units recently installed at the U. S. Steel Sheet and Tin Mill, Gary, for moving coils onto conveyors.

mill type 2000 psi hydraulic cylinder.

The dolly is pulled down to one of three gravity conveyors feeding the entry end of the pickle lines by a 2000 psi hydraulic cylinder, one of the longest stroke, 288 in., single piece cylinders ever built. Three foot-mounted mill type 2000 psi cylinders with 5 in. bores x 96 in. strokes push the coil off the dolly on to the desired gravity conveyor.

## MATERIALS:

New materials, construction methods find wide use in aircraft.

Pressure molding methods which permit use of asbestos phenolic plastics for structural aircraft parts, were described at a recent meeting of the Royal Aeronautical Society, London, recently by H. J. Pollard, Bristol Aeroplane Co., Ltd. The meeting was reported in a recent issue of *Engineering*.

An illustration of the bottom half of a moulding tool for a half-wing, in which strips of asbestos felt could be laid in slots in the die representing the skin stiffeners was shown. More felts were laid over the surface of the die, and under pressure and heat, bonded to the stiffeners.

The closed die was fed into a hydraulic press, and hot water under pressure was circulated through the die during the curing period. After curing, the moulding was cooled by circulating cold water through the die before it was removed from the press.

The raw material could also be



supplied as flock, which, when cured, had a lower strength than when moulded from felt, but in most cases was adequate for skin-stiffening members.

#### Resin-Impregnated Flock

This enabled an improved production technique to be employed, whereby asbestos felts were laid in the die to form the skin surface. The resin-impregnated flock was injected under high pressure along the slots in the closed dies. In both cases, assembly was completed by gluing two half-wing sections together, using a hot glue.

Components such as fuselages could be moulded in a pressure vessel, on the inside of which were laid the felts and ribs, together with metal laminates and attachment fittings. A rubber bag of suitable shape was inserted in the pressure vessel, and the ends were closed.

#### Use Bag for Forming

The rubber bag was inflated to the required pressure and the whole vessel was heated in an oven or by infra-red lamps. For large components, an autoclave could be used, inside which was placed a cradle on which the felts were laid and sealed, so that air could not penetrate between the felts and the cradle wall.

Heating elements were disposed round the cradle, and the inside face was connected to a vacuum to ensure that a proper seal had been made.

#### Parts Lighter

For non-structural components, such as air ducts, fairings, etc., the "no-pressure" method developed by the Royal Aircraft Establishment was used, in which the felts were laid on a pattern and cured by heating without pressure.

Resulting parts were lighter, by 25 to 30 pct than high-pressure mouldings. The vacuum-moulding technique gave better strength and consolidation and smoother surface finish.

Turn Page

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**parts:** small connecting rods

**alloy:** "600" series metal, a high strength bearing bronze that contains no tin

**quantity to date:** over 2,000,000

**number of failures:** none

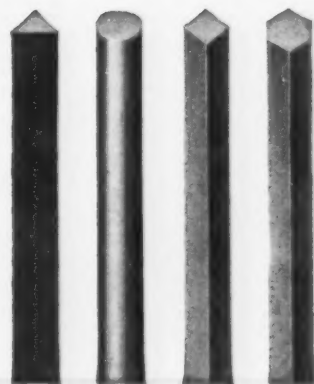
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**advantages:** no bearing insert is necessary on either the wrist pin or crankshaft end because each rod acts as its own bearing. Dense homogeneous grain structure, close dimensional tolerances and high mechanical properties often permit redesigning for weight savings as high as 15% to 25%. "600" alloys have low coefficient of friction, high resistance to corrosion and tensile strength  $2\frac{1}{2}$  times greater than cast phosphor bronzes.

**uses:** compressors, outboard motors, small high speed gasoline engines. Best results are obtained if they operate against hardened, ground and polished shafts.

**"600" SERIES ROD** is produced in standard 12-ft. mill lengths and a wide range of sizes and special shapes. This rod has a fine, uniform grain structure and the mechanical properties are rigidly controlled in the cold drawing process. Scrap loss is greatly reduced in machining operations because of the complete absence of defects. For complete information, write us today.

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## STACK MAINTENANCE:

Glass linings may point way to lower stack repair costs.

First glass-lined smoke stack in industrial history was recently claimed by A. O. Smith Corp. The pace-setting 3-ton section, 44 ft in length and 6 ft in diam, was hoisted aloft by a 120-ft boom crane to form the top section of an 85 ft power house stack at the Milwaukee plant

of the big steel fabricating firm.

Employing techniques developed over years of experimentation in its own Ceramics Laboratory, A. O. Smith coated the stack section inside and out with two glass linings, each approximating 0.005 in. in thickness.

### Bonded At 1600° F

The bonding of these linings took place at 1600° F. Special acid-resisting glass manufactured by the company's ceramics experts will combat the normal corrosion of metal caused by acid condensate in the smoke.

### Many Replaced Each Year

It is this corrosive factor which shortens the life of industrial stacks, now made overwhelmingly of steel rather than masonry. It has been estimated that upwards of 5000 such steel stacks are replaced annually in the U. S.

Sections of glass-coated steel hung in active smoke stacks for periods ranging up to a year of testing have shown no corrosive deterioration according to Wayne Deringer, director of ceramic research.

### "Guinea Pig"

Nevertheless this first glass-lined stack will constitute a "guinea pig" to be kept under observation for the next several years. If all tests prove satisfactory, A. O. Smith expects to find in the process of glass-lining stacks a new commercial adaptation of its glass-fused-to-steel techniques.

## ELECTROPOLISHING:

Nibs held in charged bath then buffed for smooth finish.

One of the first successful electropolishing operations of a platinum-base metal has been developed by Parker Pen Co., Janesville, Wis.

The operation is used to produce a precisely rounded sphere tip on fountain pen points. The tip is formed from a platinum-base metal pellet and requires a fine finish for smooth writing qualities.

### Time In Bath Varies

Nibs are first placed in an electrically-charged bath and submerged for a carefully-timed period, varying according to the size of the point. The nibs are then washed in water, after which they are buffed to a high-gloss finish.

Previous hand methods of finishing the points used grinding abrasives, which sometimes left scratches and could not be removed by burnishing. Particularly difficult to reach during the old process was the tiny slit which runs down the center of every pen point.

### Flaws Produce Friction

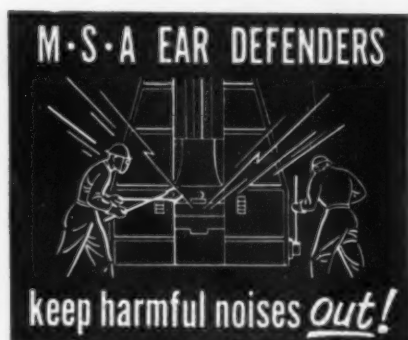
Minute flaws which produce friction and make a pen "scratch" sometimes remained near the slit in the pellet after the old process. The new electro-polishing method produces a writing point that has theoretically optimum smoothness.

## AIR POWER:

Tip-mounted turbojets may prove best helicopter power.

The turbojet, now used to power high speed fixed wing aircraft, may eventually become the best engine for large helicopters, John B. Nichols of Hiller Helicopters recently told the American Helicopter Society at its Annual Forum in Washington, D. C.

After considerable development to adapt them to this service, rotor tip-mounted turbojets should give the helicopter better performance and efficiency than that obtained with any other helicopter propulsion system now in existence, Nichols stated.



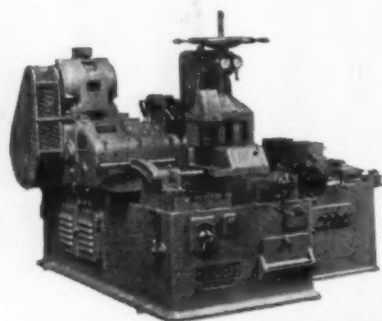
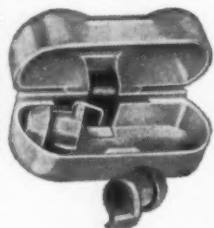
If your workers "can't hear themselves think," chances are you'll hear about it in lowered production and damaged hearing.

Loud industrial noises sap energy, interfere with job concentration, and sometimes result in serious hearing loss. M.S.A. Ear Defenders block out these costly noises, yet allow wearer to hear warning signals, speech, and telephone conversation.

M.S.A. Ear Defender design insures comfortable fit; complete closure of ear canal; easy to insert, remove. Ear Defenders are easily cleaned with soap and water. Convenient carrying case keeps them clean in pocket. Write for details.



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## WAREHOUSING:

Clamps make possible tiering of palletless crates.

Palletless handling of television crates and similarly packaged items is now possible through use of an unusual fork truck attachment.

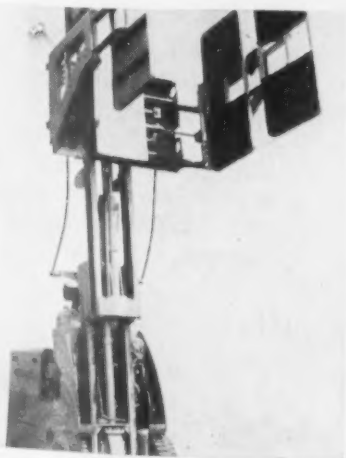
The device, made by the Automatic Transportation Co., Chicago, lifts up to eight crated TV sets at a time with hydraulically actuated, rubber-faced steel clamps.

### Vertical Travel 106 in.

Clamping range of the crate handler is from 22 to 70 in. permitting lifting and tiering of the smallest or largest size TV crate. Mounted on a 2000-lb capacity Automatic Skylift electric truck, the attachment tiers loads through 106 in. of vertical travel.

Only one control is needed to operate the clamping mechanism. By lateral movement of a handle located next to the truck's steering wheel, the clamps are opened or closed. When the handle is released, it returns to a neutral position, locking the attachment's hydraulic system.

Clamping arms also are self-compensating, insuring equal clamping force on all positions of the contacted load's surface. The attachment is readily removable, for substitution by regular forks or labor-saving attachments.



CRATE CLAMP on lift truck can be used to pick up crated products such as household appliances. Crates can then be tiered without pallets.

# YOU'RE SAFE WITH THE NEW SUPER-TOUGH

## WILLSON SAFETY HAT

THE NEW WILLSON SAFETY HAT is entirely new in design, material and method of manufacture . . . tough as metal and more resilient! Here are some other outstanding features of the new Willson Super-Tough\* Safety Hat . . .

**streamlined contour**—deflects objects more effectively and provides a greater safety "pocket" inside.

**new suspension design**—adjustable "hammock" headband is suspended *inside* at 6 points. No exposed rivets or lacing—no holes through hat.

**comfortably cool**—space between headband and shell provides ample air circulation for wearer.

**moisture resistant**—practically 100% waterproof and resists many caustics and acids.



Passes all required tests with an extra margin of safety!

Write for your copy of the new bulletin describing the Willson Super-Tough\* Safety Hat.

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Established 1870

WILLSON PRODUCTS, INC., 231 Washington Street, READING, PA.



## "Dagwood 6 Calling Danger Forward"



U. S. ARMY PHOTOGRAPH

G.I. Joe now puts his calls through a new field switchboard twice the capacity and one-third the size of the one toted by his World War II counterpart.

The new "board" has a constitution that can winter in Reykjavik, summer in Mombasa, and roll with a punch... just in case travel gets rough. Its retractable cords know when to come in out of the rain and goo.

Among the many essential parts of this instrument there is one named simply "SIGNAL, switchboard." It is a luminous-painted signal, operated by an electro-magnet, which "drops" into view when a line is calling. There's one "drop" for each telephone cord circuit; each drop is enclosed in a square housing made from Superior Hard Drawn Carbon Steel AISI C1008—.6815" I.D.

Square, .020" wall, 2.656" long. Tolerances are close— $\pm .005$ " on the length and  $+.007$ ", $-.000$ " on width.

Mr. Lloyd Bender, Vice President of the North Electric Manufacturing Company, makers of the switchboard, says of Superior, "Your performance has been excellent—in workmanship, quality of material and delivery."

Are you looking for a good small-tubing source—one that gives you the widest choice of tubing analyses available in America today, one that can supply you with one or one-million feet, one known for its uniformly high quality, and its interest in you and your tube problems? Try Superior. Superior Tube Company, 2004 Gefmantown Ave., Norristown, Pa.

Round and Shaped Tubing available in Carbon, Alloy, and Stainless Steels, Nickel Alloys, Beryllium Copper, and Titanium



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## End of Strike Threat Makes Inventories Look Better

**Consumers may alter buying policies to fit changing market outlook . . . Little hysteria left in market . . . Scrap edges up again . . . Steelmaking operations off one point.**

The worst of the steel shortage is past. Although consumer demands are expected to remain high for at least several months, steadily improving supply should result from full employment of the industry's growing capacity. This may cause a moderate decline in steelmaking operations toward the end of the year.

Steel inventories look a lot bigger now that the industry has settled its wage question without a strike. Consumers are quickly checking their supply position to see if they need to change their buying policies.

### Buying Factors Weighed . . .

Here are some of the reasons buying may become more cautious:

Peaceful wage agreement means there's no longer any motive to buy steel as a strike hedge. Such protective buying had been putting extra steam into the market prior to last weekend.

Since steel base prices will be raised quickly to cover the cost of higher wages, it is too late to buy as a hedge against higher prices. Higher steel prices have been expected for several months, and there is little doubt that many consumers pressed their buying extra hard.

Moderate improvement in international outlook makes it highly doubtful military requirements for steel will rise above current 11 or 12 pct of production. Conversely, a truce in Korea will not mean a decline in steel for defense. Barring some startling new development, steel needs for defense are pretty well set.

Major steel consuming industries appear to be at or past their peak steel demand. When it be-

comes apparent that the expanded capacity of the steel industry can fill their peak production needs, plus a little extra for inventory growth, manufacturers may change their buying policies quickly. Inventories considered less than adequate in time of shortage may be a burden in time of abundant supply. That's the way steel users have reacted to market changes in the past.

**Supplies Improving . . .** Several factors are tempering the appetite of steel's No. 1 customer—the auto industry: (1) Truck demand will not support last year's level, when the industry was under production controls. Unused steel is being shifted from cutback truck divisions to passenger car divisions. (2) Conversion and foreign steel, now at their peak, will continue on this plateau through the rest of June, July and August. After that, consumers are playing it cagey, avoiding commitments. (3) Mill deliveries are improving as new capacity comes into production. This trend will continue. (4) Supplier strikes have severely cut back independent automakers. In most cases there will be little effort to regain lost production.

Because of these factors a feeling of good supply is creeping into the Detroit market.

**Soft Spots Showing . . .** Here are some soft spots in the market: Farm equipment buying still has not materialized as in recent years. Job shops that manufacture air ducts are cutting down their buying despite the high number of housing starts. Though freight car building is at only a moderate

pace, deliveries have been nearly twice as high as new orders since the first of the year. Car backlog is lowest in 26 months.

**Expect New Record . . .** There is little, if any, hysteria left in the steel market. Business is excellent, and the industry has backlogs averaging close to 5 months. With wages settled and raw materials in good supply, prospects are bright for a record breaking year. Production may be close to 112 million net tons.

**Price Rise Coming . . .** Steel producers will move quickly to raise base prices to cover the cost of the steel wage increase. The price increase will average about \$4 a ton, based on higher wage costs of about 10¢ an hr.

Actually the across-the-board wage increases (effective June 12) is 8½¢ an hr. This will be reflected in higher cost of fringe benefits, including pensions, vacations, paid holidays, and unemployment. Also, the 5¢ remaining differential between wages in the North and South is scheduled to be wiped out; 2½¢ to be eliminated Jan. 1, 1954, and the remainder July 1, 1954. Thus, total cost of the wage settlement to steel companies will average close to 10¢ per hr, as IRON AGE predicted.

**Scrap Rises Again . . .** The wage increase will affect over 1.2 million union members, 600,000 of them in basic steel. As in the past, fabricators of steel and other metals will be quickly pressed to match the new gains.

For the third week in a row the scrap market showed signs of new strength. The Iron Age Steel Scrap Composite Price advanced 67¢ a ton to \$40.50 per gross ton. Steel operations were off 1 point.





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Imagine a "Jack-of-all-jobs" sheet and strip steel . . . good for any stamped or roll-formed product you make.

You could buy your sheet and strip the way you do nuts and bolts. And what a cinch for us . . . just to pick the right gauge and size . . . and ship!

But until that dream becomes a reality, you'll have to go right on specifying the requirements of your hurry-up jobs one-by-one . . . and we'll keep right on job-fitting Reliance sheet and strip to them . . . inventory permitting.

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U.S. REG. U.S. PAT. OFF.

- It's our "feel for steel". . . . knowing our "stuff."
- It's knowing your job . . . what you expect the steel to do for you.
- It's picking in-stock steel to meet your immediate need . . . and delivering it your way and on time.

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ROCHESTER 4, N. Y., 5 St. Paul St., BAKER 1061

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# Market Briefs and Bulletins

**Small Business Gets Most . . .** A recent Air Force survey of 97 major defense contractors showed that these companies currently hold 6420 prime contracts valued at \$15,557,000,000. However, these firms are retaining only 48 pct of these contracts while subcontracting 52 pct, worth \$8,131,000,000. Of this amount \$2,366,000, or 29 pct, has already been subcontracted to 59,965 small business firms.

**Up Tinplate Goals . . .** Office of Defense Mobilization has raised its sights for expansion of electrolytic tinplate facilities, recommending a total capacity of 4.5 million net tons by Jan. 1, 1955. This represents an increase of about 1.7 million tons above the rated 2.8 million net tons set in 1950. Initial goal called for an increase of only 1.3 million tons.

**Lower Sheet Price . . .** Continental Steel Corp. has reduced its price on galvanized sheets, 10 gage base, from \$5.475 to \$5.325 per cwt, f.o.b. Kokomo, Ind. There is an extra charge of 25¢ per cwt for 17 gage sheets and heavier.

**New Char Plant in Operation . . .** Colorado Fuel & Iron Corp., long troubled by high volatility of local coal in its coke-making operations, has installed a Petit-process char plant at its Pueblo, Colo., site. Said to be the second installation of its kind in the world, CF & I's low temperature carbonization retort processes a ton of coal per hr, recovering 1600 lb of char. The company has also installed a new coal washer which has helped raise overall coke production 16 pct to 3350 tons per day.

**Steel Increases Near . . .** Republic Steel Corp. expects to raise prices by the end of this week. Following opening of Republic's new seamless tube mill in Chicago on Monday, Charles M. White, president, said the increase "might range between ¼¢ and ½¢ a pound." That would equal \$5 to \$10 a ton.

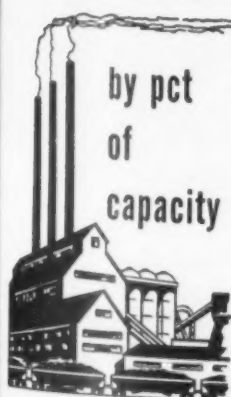
**Complete Switch to DMS . . .** National Production Authority early this week revoked CMP Regs. 1, 3, 4, and 6, effective July 1, to complete the transition to the Defense Materials System. Most of the expiring CMP regulations, 1 through 7, are covered by the new DMS Reg. 1. Construction for defense, however, will be governed by DMS Reg. 2. Authorized defense construction schedules will continue to have preferred status under Dir. 2, to Reg. 2, issued early this week and effective for the third quarter.

**New Pricing Method . . .** Standard ferromanganese is now being sold on the basis of 13.15¢ per lb of contained manganese by Electro Metallurgical Div. of Union Carbide & Carbon Corp. Old method was per gross ton of alloy with a penalty or premium for variation from standard content. The base content has also been dropped from 78 to 82 pct to 76 to 80 pct, though this no longer has any effect on the price. Several other producers are charging 10¢ per lb of alloy with a premium or penalty of 0.1¢ for each 1 pct above or below 74 to 76 pct manganese content.

**Conversion Interest Fading . . .** Consumer interest in fourth quarter conversion steel is waning. After scouting conversion steel in Chicago for 2 weeks several prospective automotive converters have gone back to Detroit. But, while interest in fourth quarter conversion is fading, several new third quarter conversion deals were reported.

**Sign Jet Agreement . . .** Westinghouse Electric Corp. and Rolls-Royce, Ltd. have signed an agreement that includes exchange of information on the design, development and production of gas-turbine jet engines. A manufacturing license agreement is expected to result some time in the future.

## STEEL OPERATIONS

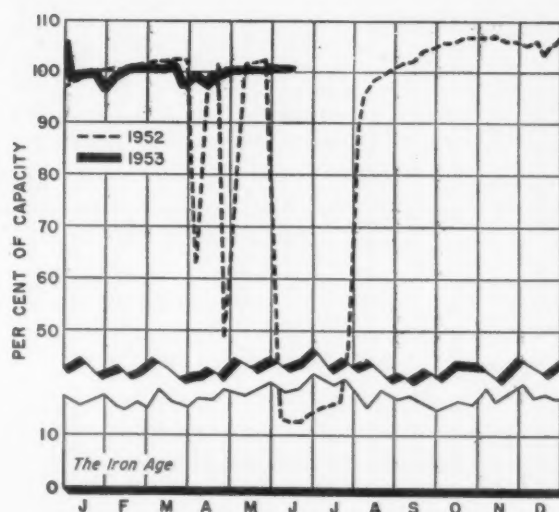


District Operating Rates

District	Week of June 14	Week of June 7
Pittsburgh	100.0	99.0*
Chicago	103.5	106.0
Philadelphia	98.0	98.0
Valley	97.0	99.0*
West	103.0	104.5*
Cleveland	93.0	92.5
Buffalo	106.5	106.5
Detroit	105.0	103.0*
Birmingham (South)	101.0	101.0
Wheeling	101.0	101.0*
South Ohio River	93.5	90.0
St. Louis	82.5	82.5*
East	90.0	87.0*
AGGREGATE	99.0	100.0

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.

\* Revised





## Copper Refiners Top Output Record

**April production of refined copper hit 117,929 tons for an alltime high . . . Deliveries to fabricators highest in 6 years . . . No word on Chile price cut—By R. L. Hatschek.**

Statistics to most people are very dull—but when they indicate a new record they take on some sparkle. And when that new record is in the production of refined copper the statistics are of more than just academic interest.

Refinery output of copper in the U. S. during May totaled 117,929 tons for an alltime high. Another bright spot in this month's Copper Institute statistical roundup is that deliveries to fabricators topped April's total by about 4500 tons to hit 146,815 tons, highest point for over six years.

**No Price Cut . . .** Last week there was considerable speculation in copper trade circles that the Chilean authorities were about to cut their copper price from its rather lofty perch well above the world market. It was assumed that the Chileans at least discussed the price situation but there was no action taken to cut the price of 35.5¢ per lb f.o.b. Chilean ports.

It seems certain that the Chilean government must soon recognize that its position cannot long be held. But when this will take place is an unknown.

**Next On List . . .** Now that the steel producers have signed with the United Steelworkers and

granted an 8½¢ per hour increase, which with all the fringes will come to about 10¢ in cost, the aluminum industry will be coming up soon on the union's list.

The USW is the biggest union in the aluminum industry, though not the only one. Contracts are still running but will expire this summer with one exception. Aluminum Co. of America and the Aluminum Workers Council (AFL) signed a 5-year pact in 1952. But this one is reopenable on 30-days' notice.

**Nothing Yet . . .** So far there have been no rumblings made at the aluminum producers—no hint as to what demands will be. But they will be made and they have traditionally followed the pattern of whatever agreement is made in the steel industry.

It seems fairly certain that an increase of the size granted in steel will have little effect on the price of primary aluminum pig or ingot. These take very little manpower to produce and the industry is doing a big job of selling its product for future markets. A higher price would hurt that effort.

But mill products and fabricated metal present a different labor picture. Whether there will be an increase or not cannot be foretold.

**Lead Inches Up . . .** Last week saw another ¼¢ boost in the U. S. price for refined lead, bringing it to 13.5¢ per lb at New York and 13.3¢ at St. Louis. The market is exhibiting a general independence from the London trade center and the price is staying above the quotation there.

Demand is good and sales for June delivery are being made on a flat price basis. For delivery next month pricing is on an average basis.

Zinc is staying very quiet. The market continues to plod along at the 11¢ E. St. Louis basis and no change is expected.

**Scrap Varies . . .** Scrap dealers' buying prices, of course, moved up a ¼¢ notch with the advance in refined lead. But No. 2 heavy copper and wire, light copper and new type shell cuttings slipped ½¢ at the dealer level.

Ingot maker and custom smelter buying prices for copper scrap have meanwhile been slipping lately. No. 1 copper wire now brings a flat 24¢ per lb, No. 2 costs 22½¢, light copper is at 21¢ and other grades are beginning to slip.

**Ingot Moves Up . . .** prices of secondary aluminum ingot climbed fractionally last week. In general the range was pushed up ¼¢ or ½¢ per lb on most grades including steel deoxidizing aluminum.

**Magnesium Output Drops . . .** April figures of the Magnesium Assn. show the first reflection of the government's magnesium production cutback. Total for the month was only 8800 tons as compared to the March peak of 10,356.

By the end of this month output will stabilize at about 6000 tons monthly. But this level isn't worrying anybody since it is more than adequate to cover the current consumer demand and some limited stockpiling. Shipments of wrought products for April totaled a record high of 1051 tons.

### NONFERROUS METAL PRICES

(Cents per lb except as noted)

	June 10	June 11	June 12	June 13	June 15	June 16
Copper, electro, Conn. ....	29.75— 30.00	29.75— 30.00	29.75— 30.00	29.75— 30.00	29.75— 30.00	29.75— 30.00
Copper, Lake delivered .....						
Tin, Straits, New York .....	92.50	93.00	93.50		93.00	93.00*
Zinc, East St. Louis .....	11.00	11.00	11.00	11.00	11.00	11.00
Lead, St. Louis .....	13.05	13.30	13.30	13.30	13.30	13.30

Note: Quotations are going prices.

\*Tentative



## \* DROP FORGINGS

For maximum strength and accuracy of metal parts, Ritco Bright Finish Drop Forgings are outstanding. Smooth and free of flash, they are produced in steel or non-ferrous metals, in weights from 1/4 lb. to 15 lbs. It pays to remember Ritco for drop forgings, special fasteners, and finished bolts with regular or heavy heads . . . also for machining and grinding.

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TRADEMARK  
LOCK NUTS

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provide more  
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than any other  
locking method

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- May be removed and re-used

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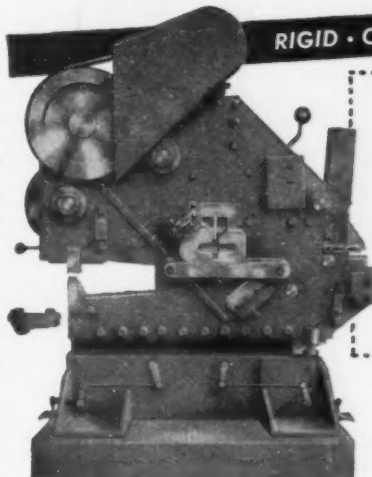
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PARTIAL SPECIFICATIONS	T 15	T 25	T 30
Punch capacity	7/8" x 7/16"	1" x 9/16"	1-3/16" x 1/2" or 1-1/16" x 3/8"
Shears Plates	7/16"	1/2"	5/8"
Shears Flats	3-3/16" x 9/16"	3-3/16" x 5/8"	4" x 3/4"
Shears Angles (Square Cut)	3 1/4" x 5/16"	4" x 3/8"	5" x 1/2"
Shears Tees	3 1/8" x 5/16"	4" x 3/8"	4 3/4"
Shears Round	1-13/16"	1 3/8"	1 3/4"
Shears Square	1"	1 1/4"	1 1/2"

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# Nonferrous Prices

(Effective June 16, 1953)

## MILL PRODUCTS

(Cents per lb, unless otherwise noted)

### Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188-in., 2S, 3S, 32.9¢; 4S, 61S-O, 34.9¢; 52S, 37.2¢; 24S-O, 24S-OAL, 35.9¢; 75S-O, 75S-OAL, 43.6¢; 0.081-in., 2S, 3S, 34.1¢; 4S, 61S-O, 36.6¢; 52S, 38.9¢; 24S-O, 24S-OAL, 37.2¢; 75S-O, 75S-OAL, 45.7¢; 0.032-in., 2S, 3S, 35.9¢; 4S, 61S-O, 40.6¢; 52S, 43.5¢; 24S-O, 24S-OAL, 45.6¢; 75S-O, 75S-OAL, 57.0¢.

Plate, 1/4-in. and heavier: 2S-F, 3S-F, 30.9¢; 4S-F, 33.0¢; 52S-F, 34.7¢; 61S-O, 35.6¢; 24S-O, 24S-OAL, 35.4¢; 75S-O, 75S-OAL, 42.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.4¢ to 80.3¢; 12 to 14, 37.1¢ to 97.2¢; 24 to 26, 39.7¢ to \$1.27; 36 to 38, 47.0¢ to \$1.86.

Rod, Rolled: 1.064-in. to 4.5-in., 2S-F, 3S-F, 41.0¢ to 86.6¢; cold-finished, 0.375-in. to 3.499-in., 2S-F, 3S-F, 44.2¢ to 38.3¢.

Screw Machine Stock: Rounds, 11S-T3, 1/4 to 11/32-in., 58.4¢ to 45.9¢; 1/2 to 1 1/2-in., 45.3¢ to 42.0¢; 1 3/4 to 2-in., 42.0¢ to 39.3¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 48.2¢ to 31.7¢; 52S, 52.4¢ to 38.3¢; 17S-T4, 59.0¢ to 41.0¢; 61S-T4, 52.9¢ to 40.5¢.

Extruded Tubing: Rounds, 6S-T5, OD 1 1/4 to 2 in., 40.5¢ to 59.0¢; 2 to 4 in., 36.6¢ to 49.7¢; 4 to 6 in., 37.1¢ to 45.3¢; 6 to 9 in., 37.6¢ to 47.5¢.

Roofing Sheet: Flat, per sheet, 0.019-in., 28 x 72 in., \$1.247; x 96 in., \$1.662; x 120 in., \$2.077; x 144 in., \$2.494. Coiled sheet, per lb, 0.019 in. x 28 in., 30.8¢; 0.024 in. x 28 in., 29.3¢.

### Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: FS1-O, 1/4 in., 66¢; 3/16 in., 63¢; 1/8 in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam 1/4 to 0.311 in., 77¢; 1/2 to 1 in., 60.5¢; 1 1/4 to 1.749 in., 56¢; 2 1/4 to 6 in., 51.5¢. Other alloys higher. Base up to 1/2 in. diam, 10,000 lb; 1/2 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/4 lb, 10,000 lb; 1/4 to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD, 1/4 to 5/16 in., \$1.43; 5/16 to 1/2 in., \$1.29; 1/2 to 3/4 in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall: OD, 1/4 to 1 in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1 1/2 in., 10,000 lb; 1 1/2 to 3 in., 20,000 lb; over 3 in., 30,000 lb.

### Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$6; Forgings, \$6.

### Nickel Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel Monel	Inconel
Sheet, CR	86 1/2	67 1/2
Strip, CR	92 1/2	70 1/2
Rod, bar	82 1/2	65 1/2
Angles, HR	82 1/2	65 1/2
Plate, HR	84 1/2	66 1/2
Seamless Tube	115 1/2	100 1/2
Shot, blocks	57	57

### Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	48.51	46.83	50.58
Copper, h-r	50.48	48.08	50.58
Copper, drawn	45.99	45.68	48.08
Low brass	42.87	42.56	45.68
Yellow brass	47.11	46.80	48.08
Naval brass	47.01	41.07	42.33
Lead brass	48.76	48.45	39.95
Comm. bronze	50.73	44.62	46.18
Mang. bronze	70.50	70.75	70.75
Phos. bronze	44.91	40.47	41.72
Muntz metal	56.56	59.83	62.89
Ni silver, 10 pct			

## PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	20.50
Aluminum pig	19.50
Antimony, American, Laredo, Tex.	34.50
Beryllium copper, per lb conta'd Be	40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	72.75
Bismuth, ton lots	32.25
Cadmium, del'd	32.00
Cobalt, 97-99% (per lb)	32.40 to 32.47
Copper, electro, Conn. Valley	29.50 to 30.00
Copper, Lake, delivered	
Gold, U. S. Treas., dollars per oz.	35.00
Iridium, 99.8%, dollars per troy oz.	32.25
Iridium, dollars per troy oz.	175 to 185
Lead, St. Louis	13.05
Lead, New York	13.25
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	27.00
Magnesium, sticks, 100 to 500 lb.	45.00 to 47.00
Mercury, dollars per 76-lb. flask, f.o.b. New York	\$194 to \$196
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	324.00
Platinum, dollars per troy oz.	\$90 to \$93
Silver, New York, cents per oz.	85.25
Tin, New York	92.75
Titanium, sponge	35.00
Zinc, East St. Louis	11.00
Zinc, New York	11.83
Zirconium copper, 60 pct	36.20

## REMELTED METALS

### Brass Ingot

(Cents per lb, delivered carloads)

85-5-5 ingot	
No. 115	26.00
No. 120	25.00
No. 123	24.00
80-10-10 ingot	
No. 305	30.00
No. 315	28.00
88-10-2 ingot	
No. 210	38.25
No. 215	34.75
No. 245	30.25
Yellow ingot	
No. 405	21.25
Manganese bronze	
No. 421	26.50

### Aluminum Ingot

(Cents per lb del'd, 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	25.25
0.60 copper, max.	24.75-25.00
Piston alloys (No. 122 type)	23.00-23.75
No. 12 alum. (No. 2 grade)	22.50-23.25
108 alloy	22.75-23.50
195 alloy	22.75
13 alloy (0.60 copper max.)	24.75-25.00
ASX-679	22.75-23.75

### Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97 1/2%	23.75-24.50
Grade 2—92-95%	23.00-23.75
Grade 3—90-92%	22.00-22.50
Grade 4—85-90%	21.00-21.50

## ELECTROPLATING SUPPLIES

### Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	45.14
Electrodeposited	37.98
Flat rolled	45.64
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	79.50
Roller, depolarized	80.50
Cadmium	32.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	94 1/4

### Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz lots, per oz.	75 1/4
Sodium cyanide, 96 pct domestic	19.25
200 lb drums	
Zinc cyanide, 100 lb drum	47.7

## SCRAP METALS

### Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over.)

	Heavy	Turnings
Copper	28%	27%
Yellow brass	21%	19%
Red brass	25%	24%
Comm. bronze	26%	25%
Mang. bronze	20	19%
Brass rod ends	19%	

### Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	24
No. 2 copper wire	22 1/2
Light copper	21
*Refinery brass	20
*Dry copper content	

### Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	24
No. 2 copper wire	22 1/2
Light copper	21
No. 1 composition	18 —18 1/2
No. 1 comp. turnings	17 1/2 —18
Roller brass	14 —14 1/2
Brass pipe	14 —14 1/2
Radiators	14 —14 1/2

### Aluminum

Mixed old cast	12 1/2 —13 1/2
Mixed new clips	15 1/2 —16
Mixed turnings, dry	13 1/2 —14
Pots and pans	13 —13 1/2

### Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	23 —23 1/2
No. 2 heavy copper and wire	20 —20 1/2
Light copper	18 —18 1/2
New type shell cuttings	18 —18 1/2
Auto radiators (unsweated)	13
No. 1 composition	16 1/2 —17
No. 1 composition turnings	16 —16 1/2
Unlined red car boxes	15 —16
Cocks and faucets	15
Mixed heavy yellow brass	11 1/2
Old rolled brass	14
Brass pipe	16
New soft brass clippings	16 1/2 —17 1/2
Brass rod ends	16 —16 1/2
No. 1 brass rod turnings	15 —16

### Aluminum

Alum. pistons and struts	6 —6 1/2
Aluminum crankcases	9
2S aluminum clippings	13
Old sheet and utensils	9
Borings and turnings	6 1/2
Misc. cast aluminum	9
Dural clips (24S)	10

### Zinc

New zinc clippings	5 1/2
Old zinc	4 1/2
Zinc routings	2 1/2
Old die cast scrap	3 1/2

### Nickel and Monel

Pure nickel clippings	100
Clean nickel turnings	60 —70
Nickel anodes	100
Nickel rod ends	33 —35
New Monel clippings	25
Clean Monel turnings	30 —32
Old sheet Monel	14
Nickel silver clippings, mixed	12
Nickel silver turnings, mixed	

### Lead

Soft scrap, lead	10 1/2 —11
Pattery plates (dry)	6 —6 1/2
Batteries, acid free	4.40 —4.80

### Magnesium

Segregated solids	15 —16
Castings	14 —15

### Miscellaneous

Block tin	80
No. 1 pewter	45
No. 1 auto babbitt	13 —13 1/2
Mixed common babbitt	16 1/2 —16 3/4
Solder joints	45
Siphon tops	16
Small foundry type	14
Monotype	12 1/2
Lino. and stereotype	11
Electrotype	8 1/2
Hand picked type shells	8
Lino. and stereo. dross	4 1/2
Electro dross	



• **NON-FERROUS METALS**

• **ORES AND MINERALS**

• **METALLIC RESIDUES**

• **METAL SCRAP**

• **FERRO ALLOYS**

• **ZINC**

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## Price Fireworks Burst in Valley

**Steel scrap prices rise up to \$5 a ton . . . Bullish trade winds blow over Cleveland . . . Pittsburgh rises up to \$3 a ton on appraisal . . . Quiet confidence among trade.**

Scrap's show of strength continued this week as major markets adjusted to more realistic levels. Buying indifference had driven scrap to the bottom but now it's bouncing back.

In Pittsburgh openhearth grades rose \$2 to \$3 a ton on an appraisal basis—influenced by increases in neighboring areas. But the Valley had the fireworks as steelmaking carloads were bought at prices ranging from \$4 to \$6 over last week. Cleveland reacted to the hypo and steel grades rose \$1.

Other centers reported varying degrees of buying interest but there seemed to be a quiet confidence among the trade that future buying would jack up scrap's price structure.

**Pittsburgh**—On an appraisal of all factors, openhearth grades of scrap advanced \$2 to \$3 per ton this week. Activity here has been at a minimum but rising prices in adjoining consuming areas have tended to strengthen this market. Due to unusual circumstances, prices in the Pittsburgh market are still lower than normal in relation to other areas. Rails and cast scrap are stronger. Demand for blast furnace grades continues weak.

**Chicago**—Chicago scrap continued under full sail. A few brokers were wondering where and why the market was going up, but all agreed that it was getting harder to pick up scrap and felt that the mills should start purchasing more heavily. With the wage issue settled and the operating rate continuing high, it seems the market will hold firm. With prices going up at nearby St. Louis, and reports of a Pittsburgh climb, Chicago price hoists seemed firmer.

**Philadelphia**—The market here is showing strength in its weakest link—No. 2 bundles. They're up \$1 as a

result of competition from the West. Prices are generally steady and no one is surprised since the market here did not sink to the depths of other areas in the recent price skid. Feeling in the trade is one of quiet strength. Prices are expected to inch up slowly in coming weeks, not skyrocket as in the Valley.

**New York**—Orders were still hiding out in this market and last week's "shade of optimism" did not increase. A flurry of broker-dealer activity seemed to have subsided. Last week's price strength in Pittsburgh was no more than a morale booster for New York. It's still difficult to overcome freight charges to ship West. Steel-making grades edged upwards.

**Detroit**—No. 2 bundles and heavy melting continued to bounce back from the unrealistic levels they had reached earlier this month. Low prices had completely dried up sheet iron sources and a higher price was necessary to bring it out. Market is not really strong, but high bidding on industrial lists has had a strengthening effect on prices.

**Cleveland**—Valley market broke wide open this week as one consumer bought a large tonnage at prices ranging from \$4 to \$6 above last week's level. As a result No. 1 steel went up \$4 to \$46, No. 2 rose \$5 to \$43 and No. 2 bundles shot up \$6 to \$41. Turnings also went up an average of \$5 on the basis of a sale. Bullish trade winds from the Valley area sent steel-making grades up \$1 in Cleveland. Even higher prices will not surprise many who expect to see the differential between Cleveland and the Valley narrowed.

**Birmingham**—Increases in prices for No. 2 heavy melting, No. 2 bundles, No. 1 cast and stove plate this week were hailed by scrap dealers as a step that would mean they could pay a better price for what they buy. Brokers, however, called it a levelling

off process, said it did not mean that mills were pressed for scrap. Prices have been too low, they say, and increases indicate mills realize they have been drying up supply. They predict an increase on other grades will follow low shortly.

**St. Louis**—A leading steel mill bought a sizable tonnage of No. 2 heavy melting at an increase of \$1 a ton over the previous quotation, which caused a similar boost in No. 2 bundles. Yards report receipts approximately 60 pct below normal for this time of year, as truckers and farmers complain prices are too low to handle scrap.

**Cincinnati**—There seems to be a much firmer tone in this market but buying is minimal. Higher prices are expected in July but turnings and rails are the only items topping May buying prices. Increased demand has moved price of mixed borings and turnings and cast iron borings up \$2 to \$23. Short turnings registered the biggest gain, moving up \$3 to \$24. Two largest consumers in this area don't intend to do any buying for the rest of the month.

**Boston**—The sudden spurt that started scrap prices upward last week has spread to New England with the result that steelmaking grades this week are quoted \$2 to \$3 higher. Demand is strong for good quality material. Stove plate eased slightly in price.

**Buffalo**—Scrap market appeared to be levelling off as the top mill buyer placed new business which was generally within quoted price ranges. Buying by Valley consumers in the midstate area has bolstered the local market. Midstate supplies usually come here. Cast market continues weak with cupola off from \$1 to \$2 with buying interests negligible.

**West Coast**—Pressure for export licenses continues to grow in the face of a slow market, but chances appear slim. Eager shipping firms, however, declared open rates for 90 days on scrap. California dealers are exerting pressure in Washington on a hardship basis, claiming bulging inventories although mill offers to buy at going rates have been rejected.





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WARREN, OHIO; HUBBARD, OHIO



# Scrap Prices

(Effective June 16, 1958)

## Pittsburgh

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	36.00 to 37.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and ms. turns.	24.00 to 25.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. punch'gs, plate	48.00 to 49.00
Heavy turnings	40.00 to 41.00
No. 1 RR. hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	53.00 to 54.00
RR. steel wheels	51.00 to 52.00
RR. spring steel	51.00 to 52.00
RR. couplers and knuckles	51.00 to 52.00
No. 1 machinery cast.	49.00 to 50.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	39.00 to 40.00
Malleable	46.00 to 47.00

## Chicago

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 factory bundles	40.00 to 41.00
No. 1 dealers' bundles	39.00 to 40.00
No. 2 dealers' bundles	33.00 to 34.00
Machine shop turn.	21.00 to 22.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Low phos. forge crops	46.00 to 47.00
Low phos. punch'gs, plate	42.00 to 44.00
Low phos. 3 ft and under	42.00 to 43.00
No. 1 RR. hvy. melting	42.00 to 43.00
Scrap rails, random lgth.	45.00 to 46.00
Rerolling rails	48.00 to 49.00
Rails 2 ft and under	50.00 to 51.00
Locomotive tires, cut	45.00 to 46.00
Cut bolsters & side frames	45.00 to 46.00
Angles and splice bars	46.00 to 48.00
RR. steel car axles	51.00 to 52.00
RR. couplers and knuckles	46.00 to 47.00
No. 1 machinery cast.	42.00 to 44.00
Cupola cast.	37.00 to 40.00
Heavy breakable cast.	32.00 to 33.00
Cast iron brake shoes	36.00 to 37.00
Cast iron car wheels	39.00 to 41.00
Malleable	38.00 to 40.00
Stove plate	32.00 to 33.00

## Philadelphia Area

No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	31.00 to 32.00
Machine shop turn.	26.00 to 27.00
Mixed bor., short turn.	30.00 to 31.00
Shoveling turnings	31.00 to 32.00
Clean cast chem. borings	38.50 to 39.00
Low phos. 5 ft and under	43.50 to 44.50
Low phos. 2 ft and under	45.00 to 46.00
Low phos. punchings	45.50 to 46.50
Elec. furnace bundles	43.50 to 44.50
Heavy turnings	39.50 to 40.50
RR. steel wheels	49.00 to 50.00
RR. spring steel	49.00 to 50.00
Rails 18 in. and under	55.00 to 56.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	41.00 to 42.00
Cast iron car wheels	46.00 to 47.00
Malleable	46.00 to 47.00
Unstripped motor blocks	27.00 to 28.00
No. 1 machinery cast.	47.00 to 48.00
Charging box cast.	39.00 to 41.00

## Cleveland

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	28.00 to 29.00
Low phos. 2 ft and under	46.00 to 47.00
Drop forge flashings	41.00 to 42.00
No. 1 RR. hvy. melting	47.00 to 48.00
Rails 3 ft and under	52.00 to 53.00
Rails 18 in. and under	52.00 to 53.00
Railroad grate bars	40.00 to 41.00
Steel axle turnings	38.00 to 39.00
Railroad cast	48.00 to 49.00
No. 1 machinery cast.	48.00 to 49.00
Stove plate	43.00 to 44.00
Malleable	48.00 to 49.00

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

## Youngstown

No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	40.00 to 41.00
Machine shop turn.	27.00 to 28.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	31.00 to 32.00
Low phos. plate	47.00 to 48.00

## Buffalo

No. 1 hvy. melting	\$40.50 to \$41.50
No. 2 hvy. melting	38.00 to 38.50
No. 1 busheling	40.00 to 40.50
No. 1 bundles	40.50 to 41.50
No. 2 bundles	36.00 to 36.50
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	29.00 to 29.50
Shoveling turnings	30.00 to 30.50
Cast iron borings	29.00 to 29.50
Low phos. plate	44.00 to 45.00
Scrap rails, random lgth.	45.75 to 46.75
Rails 2 ft and under	51.75 to 52.75
RR. steel wheels	50.50 to 51.50
RR. spring steel	50.75 to 51.75
RR. couplers and knuckles	50.50 to 51.00
No. 1 machinery cast.	42.00 to 43.00
No. 1 cupola cast.	36.00 to 37.00

## Detroit

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles, openhearth	37.00 to 38.00
No. 2 bundles	29.00 to 30.00
New busheling	34.00 to 35.00
Drop forge flashings	34.00 to 35.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Electric furnace, bundles	37.00 to 38.00
Low phos. punch'gs, plate	37.00 to 38.00
No. 1 cupola cast	44.00
Heavy breakable cast.	36.00
Stove plate	36.00
Automotive cast.	44.00

## St. Louis

No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	33.00 to 34.00
No. 2 bundled sheets	30.00 to 31.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	11.00 to 13.00
Rails, random lengths	41.00 to 42.00
Rails 18 in. and under	49.00 to 51.00
Locomotive tires, uncut.	43.00 to 44.00
Angles and splice bars	43.00 to 44.00
Std. steel car axles	46.00 to 48.00
RR. spring steel	43.00 to 44.00
Cupola cast.	39.00 to 41.00
Hvy. breakable cast.	30.00 to 32.00
Cast iron brake shoes	38.00 to 39.00
Stove plate	37.00 to 38.00
Cast iron car wheels	43.00 to 44.00
Malleable	35.00 to 36.00
Unstripped motor blocks	33.00 to 34.00

## New York

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	29.00 to 31.00
No. 2 bundles	27.00 to 28.00
Low phos. 2 ft and less	37.00 to 38.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	22.00 to 23.00
Clean cast chem. borings	29.00 to 30.00
No. 1 machinery cast.	42.00 to 43.00
Mixed yard cast.	33.00 to 34.00
Charging box cast.	34.00 to 35.00
Heavy breakable cast.	24.00 to 25.00
Unstripped motor blocks	22.00 to 23.00

## Birmingham

No. 1 hvy. melting	\$29.50 to \$30.50
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles	29.50 to 30.50
No. 2 bundles	29.00 to 30.00
No. 1 busheling	29.50 to 30.50
Machine shop turn.	20.75 to 21.75
Shoveling turnings	22.75 to 23.75
Cast iron borings	22.75 to 23.75
Electric furnace bundles	32.00 to 33.00
Bar crops and plate	39.00 to 40.00
Structural and plate, 3 ft.	36.00 to 37.00
No. 1 RR. hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	41.00 to 42.00
Rerolling rails	45.00 to 46.00
Rails, 18 in. and under	45.00 to 46.00
Angles & splice bars	45.00 to 46.00
Std. steel axles	45.00 to 46.00
No. 1 cupola cast	39.00 to 40.00
Stove plate	35.00 to 36.00
Cast iron car wheels	46.00 to 47.00
Charging box cast.	30.00 to 31.00
Heavy breakable	30.00 to 31.00
Unstripped motor blocks	33.00 to 33.00
Mashed tin cans	17.00 to 18.00

## Boston

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$33.25
No. 2 hvy. melting	28.00
No. 1 bundles	32.00
No. 2 bundles	26.00
No. 1 busheling	32.00
Elec. furnace, 3 ft & under	33.25
Machine shop turn.	16.00 to 17.00
Mixed bor. and short turn.	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Clean cast chem. borings	38.17
No. 1 machinery cast	30.00 to 31.00
Mixed cupola cast.	26.00 to 28.00
Heavy breakable cast.	27.00 to 29.00
Stove plate	26.00
Unstripped motor blocks	22.00

## Cincinnati

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	22.00 to 23.00
Low phos. 18 in. & under	46.00 to 47.00
Rails, random lengths	44.00 to 45.00
Rails, 18 in. and under	52.00 to 53.00
No. 1 cupola cast	41.00 to 42.00
Hvy. breakable cast.	37.00 to 38.00
Drop broken cast.	45.00 to 46.00

## San Francisco

No. 1 hvy. melting	\$28.00
No. 2 hvy. melting	24.00
No. 1 bundles	25.00
No. 2 bundles	22.00
No. 3 bundles	18.00
Machine shop turn.	10.00
Cast iron borings	15.00
No. 1 RR. hvy. melting	28.00
No. 1 cupola cast.	\$38.00 to \$39.00

## Los Angeles

No. 1 hvy. melting	\$24.00
No. 2 hvy. melting	20.00
No. 1 bundles	23.00
No. 2 bundles	20.00
No. 3 bundles	16.00
Mach. shop turn.	1.00
Shoveling turnings	12.00
Cast iron borings	12.00
Elec. fur. 1 ft and under	29.00
No. 1 RR. hvy. melting	24.00
No. 1 cupola cast.	36.00

## Seattle

No. 1 hvy. melting	\$31.00
No. 2 hvy. melting	27.00
No. 1 bundles	28.00
No. 2 bundles	23.00
No. 1 cupola cast.	37.00
Mixed yard cast.	36.00

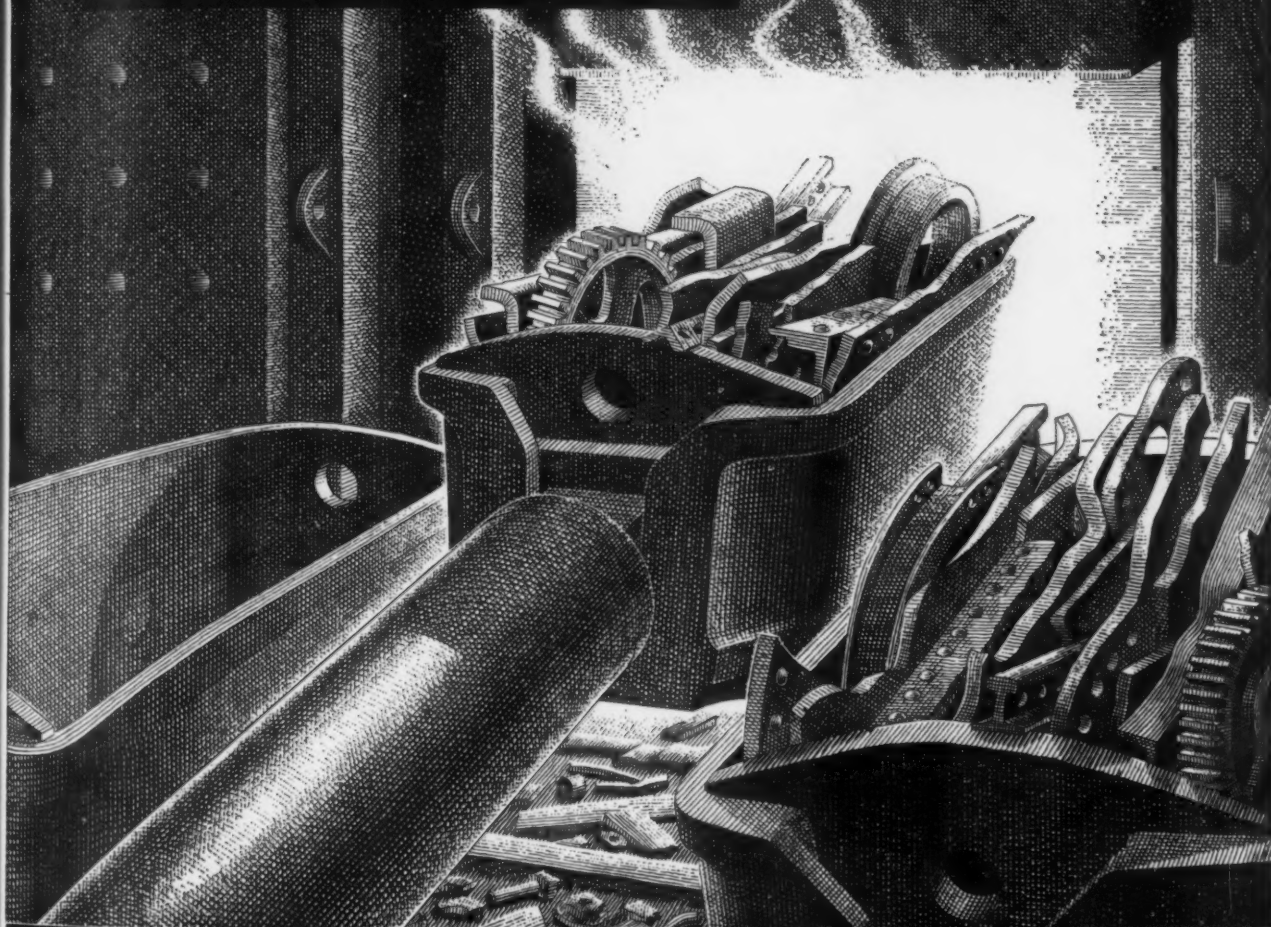
## Hamilton Ont.

No. 1 hvy. melting	\$32.00
No. 1 bundles	32.50
No. 2 bundles	32.00
Mechanical bundles	30.50
Mixed steel scrap	28.50
Bushelings	27.50
Bush., new fact. prep'd.	30.50
Bush., new fact. unprep'd.	29.50
Short steel turnings	26.50
Mixed bor. and turn.	26.50
Rails, remelting	32.50
Rails, rerolling	41.00
Cast scrap	50.00



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 CLEVELAND, OHIO NEW YORK, N. Y. SAN FRANCISCO, CAL.  
 SEATTLE, WASH.

**LEADERS IN IRON AND STEEL SCRAP SINCE 1889**



## Comparison of Prices

(Effective June 16, 1953)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	June 16 1953	June 9 1953	May 19 1953	June 17 1952
<b>Flat-Rolled Steel: (per pound)</b>				
Hot-rolled sheets	3.775¢	3.775¢	3.775¢	3.60¢
Cold-rolled sheets	4.575	4.575	4.575	4.35
Galvanized sheets (10 gal)	5.075	5.075	5.075	4.80
Hot-rolled strip	3.725	3.725	3.725	3.50
Cold-rolled strip	5.20	5.20	5.20	4.75
Plate	3.90	3.90	3.90	3.70
Plates wrought iron	9.00	9.00	9.00	7.85
Stainl's C-R strip (No. 302)	39.75	39.75	39.75	36.75
<b>Tin and Ternplate: (per base box)</b>				
Tinplate (1.50 lb.) cokes	88.95	88.95	88.95	88.70
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.40
Special coated mfg. ternes	7.75	7.75	7.75	7.50
<b>Bars and Shapes: (per pound)</b>				
Merchant bars	3.95¢	3.95¢	3.95¢	3.70¢
Cold finished bars	4.925	4.925	4.925	4.55
Alloy bars	4.675	4.675	4.675	4.30
Structural shapes	3.85	3.85	3.85	3.65
Stainless bars (No. 302)	34.00	34.00	34.00	31.50
Wrought iron bars	10.05	10.05	10.05	9.50
<b>Wire: (per pound)</b>				
Bright wire	5.225¢	5.225¢	5.225¢	4.85¢
<b>Rails: (per 100 lb.)</b>				
Heavy rails	34.075	34.075	34.075	33.60
Light rails	5.00	5.00	5.00	4.00
<b>Semifinished Steel: (per net ton)</b>				
Re-rolling billets	\$59.00	\$59.00	\$59.00	\$56.00
Slabs, re-rolling	59.00	59.00	59.00	56.00
Forging billets	70.50	70.50	70.50	66.00
Alloy blooms, billets, slabs	76.00	76.00	76.00	70.00
<b>Wire Rod and Skelp: (per pound)</b>				
Wire rods	4.325¢	4.325¢	4.325¢	4.10¢
Skelp	3.55	3.55	3.55	3.35

Composite: (per pound)

Finished steel base price ..... 4.417¢ 4.417¢ 4.890¢ 4.181¢

	June 16 1953	June 9 1953	May 19 1953	June 17 1952
<b>Pig Iron: (per gross ton)</b>				
Foundry, del'd Phila.	\$60.69	\$60.69	\$60.69	\$58.19
Foundry, Valley	55.00	55.00	55.00	52.50
Foundry, Southern, Cin'ti	58.93	58.93	58.93	56.58
Foundry, Birmingham	51.38	51.38	51.38	48.88
Foundry, Chicago	55.00	55.00	55.00	52.50
Basic del'd Philadelphia	59.77	59.77	59.77	57.27
Basic, Valley furnace	54.50	54.50	54.50	52.00
Malleable, Chicago	55.00	55.00	55.00	52.50
Malleable, Valley	55.00	55.00	55.00	52.50
Ferromanganese, cents per lb.	10.00¢	9.92¢	9.85¢	8.66¢

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡ Average of U. S. Prices quoted on Ferroalloy pages, 76 pct Mn basis.

<b>Composite: (per gross ton)</b>	\$55.26	\$55.26	\$55.26	\$52.77
<b>Pig Iron: (per gross ton)</b>				
No. 1 steel, Pittsburgh	\$42.50	\$40.50	\$38.50	\$43.00*
No. 1 steel, Phila. area	40.50	40.50	40.50	41.50*
No. 1 steel, Chicago	38.50	38.50	38.50	41.50*
No. 1 bundles, Detroit	37.50	37.50	37.50	41.50*
Low phos., Youngstown	46.50	46.50	46.50	46.50*
No. 1 mach'y cast, Pittsburgh	49.50	49.50	49.50	52.75
No. 1 mach'y cast, Philadel'a	47.50	47.50	47.50	52.00*
No. 1 mach'y cast, Chicago	43.00	43.00	41.00	44.50

\* Basing pt., less broker's fee. † Shipping pt., less broker's fee.

<b>Composite: (per gross ton)</b>	\$40.50	\$39.83*	\$38.17	\$42.00
No. 1 heavy melting scrap	\$40.50	\$39.83*	\$38.17	\$42.00
<b>Coke, Connellville: (per net ton at oven)</b>				
Furnace coke, prompt	\$14.75	\$14.75	\$14.75	\$14.75
Foundry coke, prompt	17.25	17.25	17.25	17.75

<b>Nonferrous Metals: (cents per pound to large buyers)</b>				
Copper, electrolytic, Conn.	29.875¢	29.875¢	29.875¢	24.50
Copper, Lake, Conn.	29.875¢	29.875¢	29.875¢	24.50
Tin, straits, New York	93.00¢	91.75*	91.00	\$1.21
Zinc, East St. Louis	11.00	11.00	11.00	16.00
Lend, St. Louis	13.30	13.05	12.80	14.80
Aluminum, virgin ingot	20.50	20.50	20.50	19.00
Nickel, electrolytic	63.08	63.08	63.08	59.58
Magnesium, ingot	27.00	27.00	27.00	24.50
Antimony, Laredo, Tex.	34.50	34.50	34.50	39.00

† Tentative. ‡ Average. \* Revised.

## Composite Price Notes

### Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

### Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

### Scrap Steel Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

## Warehouse Price Notes

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1) 500 to 1499 lb. (2) 20,000 lb or over.

Warehouses		Base price, f.o.b., dollars per 100 lb.											
		Sheets		Strip		Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled	Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 415	Hot-Rolled A 410	Cold-Drawn A 415	Cold-Drawn A 410
Cities	City Delivery Charge												
Baltimore	\$.20	5.96	7.25	7.38	6.68	.....	6.55	6.59	6.56	7.64	.....	.....	.....
Birmingham	.15	5.80	6.65	7.70 <sup>1</sup>	5.80	.....	6.10	5.95	5.80	8.62	.....	.....	.....
Boston	.20	6.66	7.54	8.39	6.81	9.00 <sup>2</sup>	6.83	6.68	6.57	7.82	11.98	11.79	14.21
Buffalo	.20	5.95	6.85	8.71	6.47	.....	6.38	6.20	6.05	7.15	.....	11.85	14.15
Chicago	.20	5.95	6.82	7.75	6.10	.....	6.03	6.07	5.96	7.025	.....	11.45	13.75
Cincinnati	.20	5.96	6.89	7.90	6.40	.....	6.08	6.54	6.28	7.38	.....	11.87	14.17
Cleveland	.20	5.95	6.82	7.95	6.27	.....	6.25	6.40	6.04	7.10	.....	10.79	13.89
Denver	.....	5.96	6.83	8.04	.....	.....	.....	.....	.....	.....	.....	11.59	15.25
Detroit	.20	7.70	8.55	9.79	7.60	.....	7.55	7.55	7.60	8.80	.....	.....	.....
Houston	.20	6.15	7.00	8.04	6.39	7.05	6.55	6.54	6.26	7.32	11.97	11.57	14.02
Kansas City	.20	6.22	7.02	8.59	6.50	7.67	6.57	6.57	6.27	7.55	11.82	11.82	14.12
Los Angeles	.20	6.75	7.00	8.62	6.95	.....	6.75	6.80	6.95	7.55	13.15	12.65	14.63
Memphis	.10	6.90	7.73	9.20	7.16	.....	6.86	6.95	7.13	.....	.....	11.87	14.90
Milwaukee	.20	6.62	7.46	8.42	6.77	.....	6.75	6.74	6.65	7.80	.....	.....	.....
New Orleans	.15	7.49	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New York	.30	7.05	8.70	8.45	7.05	10.10	6.90	6.75	6.85	9.40	12.45	11.95	14.50
Norfolk	.20	6.56	7.40	8.90	7.20	10.85	6.80	6.95	10.10	13.00	12.75	15.30	15.55
Philadelphia	.25	6.77	7.50	8.60	6.60	.....	6.71	6.71	6.57	7.52	.....	.....	.....
Pittsburgh	.20	6.12	6.99	7.92	6.27	.....	6.98	6.83	7.98	.....	11.62	.....	13.92
Portland	.20	6.13	6.99	8.47	6.28	.....	6.20	6.24	6.15	7.295	.....	.....	.....
Salt Lake City	.20	6.28	7.12	8.48	6.32	8.13	6.43	6.43	6.31	8.05	.....	.....	.....
San Francisco	.15	6.54	7.45	8.72	6.72	.....	6.67	6.50	6.75	7.90	12.00	11.84	14.14
Seattle	.20	6.77	7.59	8.82	6.82	.....	6.95	6.95	7.00	8.50	.....	.....	.....
St. Louis	.20	6.75	.....	.....	7.00	.....	6.95	6.95	7.00	8.50	.....	.....	.....
St. Paul	.15	6.30	7.13	7.53	6.70	5.80	6.30	6.30	6.57	7.66	11.74	11.59	13.89
		7.85	8.00	8.30	6.20	.....	6.03	6.07	5.98	7.12	.....	11.45	13.75
		5.96	6.82	8.30	6.23	.....	7.05	7.25	7.25	9.40	.....	.....	.....
		7.80	9.05	9.30	7.50	.....	7.85	8.00	8.40	11.25	.....	.....	.....
		8.80	8.80	11.30	8.55	.....	6.90	6.50	6.85	9.40	13.00	12.50	15.30
		7.15	8.40	9.25	7.05	10.00	6.75	6.75	6.85	9.50	.....	12.75	15.55
		7.90	8.20	9.00	7.50	.....	7.05	6.70	7.07	8.54	.....	13.00	15.30
		7.67	8.40	9.88	7.75	.....	7.25	6.97	7.27	9.74	.....	.....	.....
		6.23	7.12	8.05	6.40	8.07	6.43	6.47	6.28	7.43	11.90	11.75	14.85
		7.67	8.41	8.56	6.77	.....	6.69	6.73	6.64	7.78	.....	11.86	.....



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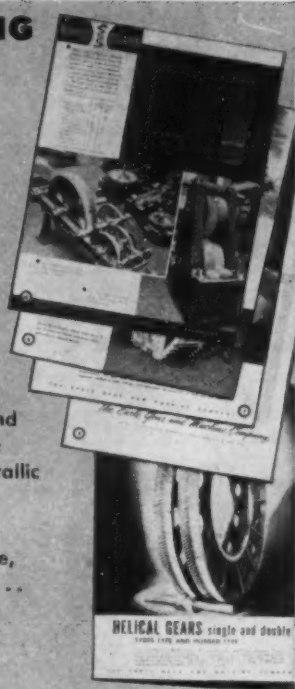
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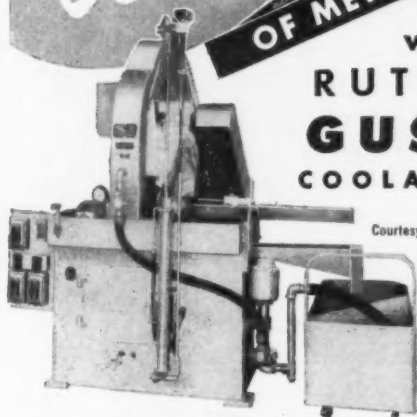


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The **MACLEOD** Company

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## IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

**STEEL  
PRICES**(Effective  
June 16, 1953)

		INGOTS		BILLETS, BLOOMS, SLABS		PIPE SKELE	PIL- ING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem, Pa.					\$76.00 B3		3.90 B3	5.80 B3				
	Buffalo, N. Y.			\$59.00 B3	\$70.50 B3, R3	\$76.00 B3, R3	4.675 B3	3.90 B3	5.80 B3	3.725 B3, R3	5.10 B3	5.70 B3	7.90 B3
	Claymont, Del.												
	Coatesville, Pa.												
	Conschohocken, Pa.				\$77.50 A2	\$83.00 A2				4.125 A2		5.90 A2	
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johansstown, Pa.			\$59.00 B3	\$70.50 B3	\$76.00 B3		3.90 B3	5.80 B3	3.725 B3			
	Newark, N. J.												
	New Haven, Conn.										5.60 A5 5.85 D1		
	Phoenixville, Pa.							4.95 P2					
	Putnam, Conn.												
	Sparrows Pt., Md.									3.725 B3	5.10 B3	5.70 B3	7.90 B3
	Worcester, Mass.												
	Trenton, N. J.										6.45 R4		
MIDDLE WEST	Alton, Ill.									4.20 L1			
	Ashland, Ky.									3.725 A7			
	Canton-Massillon, Ohio				\$70.50 R3	\$76.00 R3 \$78.60 T5							
	Chicago, Ill.			\$59.00 U1	\$70.50 U1, R3, W8	\$76.00 U1, R3, W8	4.675 U1	3.85 U1, W8	5.80 U1	3.725 A1, W8	5.35 A1		
	Sterling, Ill.									4.725 N4			
	Cleveland, Ohio				\$70.50 R3						5.10 A5, J3		7.45 J3
	Detroit, Mich.	\$56.00 R5	\$57.00 R5		\$73.50 R5	\$79.00 R5				4.025 G3 4.40 M2	5.30 G3 5.45 M2 5.60 D1 6.05 D2	8.30 G3	8.15 G3
	Duluth, Minn.												
	Gary, Ind. Harbor, Indiana			\$59.00 U1	\$70.50 U1	\$76.00 U1, Y1	4.675 J3	3.85 J3, U1	5.80 J3, U1 6.30 Y1	3.725 J3, U1, Y1	5.35 J3	5.65 J3, U1 6.15 Y1	
	Granite City, Ill.												
	Kokomo, Ind.												
	Middletown, Ohio										5.10 A7		
	Niles, Ohio Sharon, Pa.									4.225 S1	5.70 T4 5.80 S1	5.65 S1	7.30 S1
	Pittsburgh, Pa. Midland, Pa.	\$54.00 U1	\$57.00 U1, C11	\$59.00 U1	\$70.50 U1	\$76.00 U1, C11	3.55 U1 3.65 J3	4.675 U1	3.85 U1, J3	5.80 U1, J3	3.725 A7 3.975 A3 4.225 S7, S9	5.10 J3, A7 5.45 A3 5.80 B4, S7	7.45 J3
WEST	Portsmouth, Ohio												
	Weirton, Wheeling, Follansbee, W. Va.							4.10 W3		3.825 W3	5.10 W3	6.10 W3	7.95 W3
	Youngstown, Ohio					\$76.00 Y1, C10	3.55 U1 R3		6.30 Y1	3.725 U1, Y1, R3	5.10 R3, Y1 5.70 C5 5.80 B4	5.65 R3, U1 6.15 Y1	7.30 R3 7.80 Y1
	Fontana, Cal.	\$81.00 K1	\$83.00 K1	\$78.00 K1	\$89.50 K1	\$95.00 K1		4.50 K1	6.45 K1	5.175 K1	7.00 K1	6.75 K1	
	Geneva, Utah				\$70.50 C7			3.85 C7	5.80 C7				
	Kansas City, Mo.							4.45 S2		4.325 S2			
	Los Angeles, Torrance, Cal.				\$89.50 B2	\$96.00 B2		4.45 C7, B2	6.35 B2	4.475 C7, B2	7.15 C1	6.40 B2	
	Minnequa, Colo.							4.30 C6		4.775 C6			
	San Francisco, Niles, Pittsburg, Cal.				\$89.50 B2			4.40 B2 4.56 P9	6.30 B2	4.475 C7, B2		6.40 B2	
	Seattle, Wash.				\$89.50 B2, S11	\$96.00 S11		4.50 B2	6.40 B2	4.725 B2		6.65 B2	
	Atlanta, Ga.									4.275 A8			
	Fairfield, Ala. Alabama City, Ala.			\$59.00 T2	\$70.50 T2			3.85 T2, R3	5.80 T2	3.725 T2, R3		5.65 T2	
	Houston, Texas		\$65.00 S2		\$78.50 S2	\$84.00 S2		4.25 S2		4.125 S2			
SOUTH													



*Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.*

IRON AGE

# STEEL PRICES

(Effective June 18, 1953)

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled 18 ga. & hvyt.	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Ternc 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 1.25-lb. base box	Hollowware Enameling 29 ga.	
3.775 B3	4.575 B3				5.675 B3	6.925 B3							Bethlehem, Pa.
													Buffalo, N. Y.
													Claymont, Del.
													Coatesville, Pa.
4.175 A2					5.925 A2								Conshehocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.325 B3				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
													Putnam, Conn.
3.775 B3	4.575 B3	5.075 B3			5.675 B3	6.925 B3	7.775 B3		4.425 B3	\$8.80 B3	\$7.50 B3		Sparrow Pt., Md.
									4.625 A5				Worcester, Mass.
									4.425 R4				Trenton, N. J.
									4.70 L1				Alton, Ill.
3.775 A7		5.075 A7	4.925 A7										Ashland, Ky.
		5.075 R3											Canton-Massillon, Ohio
3.775 W8					5.675 U1				4.325 A,5 N4,R3				Chicago, Ill.
									4.425 N4				Sterling, Ill.
3.775 R3, J3	4.575 R3, J3		4.925 R3		5.675 R3, J3	6.925 R3, J3			4.325 A5				Cleveland, Ohio
3.975 G3	4.775 G3				6.225 G3	7.475 G3							Detroit, Mich.
													Duluth, Minn.
3.775 I3, U1,Y1	4.575 I3, U1,Y1	5.075 I3, U1	4.925 U1	5.475 U1	5.675 I3, U1 6.175 Y1	6.925 I3, U1 7.425 Y1				\$8.70 U1, I3,Y1	\$7.40 U1, I3	6.10 U1, Y1	Gary, Ind. Harbor, Indiana
4.30 G2	5.275 G2	5.275 G2	5.625 G2								\$7.60 G2	6.30 G2	Granite City, Ill.
		5.325 C9											Kokomo, Ind.
	4.575 A7		4.925 A7	5.475 A7									Middletown, Ohio
4.175 S1					5.675 S1						\$7.40 R3		Niles, Ohio Sharon, Pa.
3.775 U1, J3,A7 3.925 A3	4.575 U1, J3,A7	5.075 U1	4.925 U1		5.675 U1, J3	6.925 U1, J3	7.625 U1		4.325 A5 4.525 P6	\$8.70 U1, J3	\$7.40 U1, J3	6.10 U1	Pittsburgh, Pa. Midland, Pa.
									4.525 P7				Portsmouth, Ohio
3.775 W3, W5	4.575 W3, W5	5.075 W3, W5		5.475 W3, W5	6.025 W3	7.275 W3				\$8.70 W3, W5	\$7.40 W3, W5	6.35 W5	Weirton, Wheeling, Follansbee, W. Va.
3.775 U1, R3,Y1	4.575 R3, Y1	5.775 R1	4.925 Y1	6.05 E2	5.675 R3, U1 6.175 Y1	6.925 R3 7.425 Y1	5.45 E2 5.825 R1		4.325 Y1	\$8.70 R3			Youngstown, Ohio
4.825 K1	5.675 K1				6.775 K1	7.975 K1			5.125 K1				Fontana, Cal.
3.875 C7													Geneva, Utah
													Kansas City, Mo.
4.475 C7		5.825 C7					5.575 C7		5.125 C7,B2				Los Angeles, Torrance, Cal.
									4.575 C6				Minnequa, Colo.
4.475 C7	5.525 C7	5.825 C7							4.975 C7	\$9.45 C7	\$8.15 C7		San Francisco, Niles, Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.775 T2, R3	4.575 T2	5.075 T2, R3			5.675 T2			4.925 R3	4.325 T2, R3	\$8.80 T2	\$7.50 T2		Fairfield, Ala. Alabama City, Ala.
									4.725 S2				Houston, Texas

June 18, 1953



## IRON AGE

**STEEL  
PRICES***(Effective  
June 16, 1958)**Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.*

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	
EAST	Bethlehem, Pa.				4.675 B3	6.00 B3	5.925 B3					
	Buffalo, N. Y.	3.95 B3,R3	3.95 B3,R3	4.975 B5	4.675 B3,R3	6.00 B3,B5	5.925 B3	3.90 B3			5.95 B3	
	Claymont, Del.							4.35 C4		5.35 C4		
	Coatesville, Pa.							4.35 L4		5.75 L4		
	Conschohocken, Pa.							4.35 A2	4.95 A2		6.20 A2	
	Harriaburg, Pa.							6.50 C3	6.50 C3			
	Hartford, Conn.			4.475 R3		6.45 R3						
	Johnstown, Pa.	3.95 B3	3.95 B3		4.675 B3		5.925 B3	3.90 B3		5.25 B3	5.95 B3	5.225 B3
	Newark, N. J.			5.375 W10		6.35 W10						
	New Haven, Conn.											
	Camden, N. J.			5.375 P10		6.35 P10						
	Putnam, Conn.			5.475 W10								
	Sparrows Pt., Md.		3.95 B3					3.90 B3		5.25 B3	5.95 B3	5.325 B3
	Worcester, Mass.					6.35 A5						5.525 A5
	Trenton, N. J.											
MIDDLE WEST	Alton, Ill.	4.50 L1										5.45 L1
	Ashland, Ky.							3.90 A7				
	Canton-Massillon, Ohio	3.95 R3		4.925 R2,R3	4.675 R3 4.72 T5	5.99 T5 6.00 R2,R3						
	Chicago, Ill.	3.95 U1,W8, R3	3.95 R3 4.70 N4	4.925 A5,B5 W8,W10	4.675 R3,U1, W8	6.00 B5,L2, R3,W8,W10 6.05 A5		3.90 U1,W8	4.95 U1	5.25 U1	5.95 U1	5.225 A5, N4,R3 5.325 R2 5.475 W7
	Cleveland, Ohio	3.95 R3	3.95 R3	4.925 A5,C13		6.00 C13 6.05 A5	5.925 R3	3.90 R3,J3	4.95 J3		5.95 R3,J3	5.225 A5, C13,R3
	Detroit, Mich.	4.10 R5 4.30 G3		5.075 R5,P8 5.175 P3 5.125 P5	4.825 R5 5.025 G3	6.15 R5,P8 6.20 P3,B5	6.675 G3	4.45 G3			6.90 G3	
	Duluth, Minn.											5.225 A5
	Gary, Ind. Harbor, Crawfordsville, Indiana	3.95 J3,U1, Y1	3.95 J3,U1, Y1	4.925 L2, M5,R3	4.675 J3,U1, Y1	6.00 L2,M5, R3,R5	5.925 J3,U1, 6.425 Y1	3.90 J3,U1, Y1	4.95 J3	5.25 U1	5.95 J3,U1, 6.45 Y1	5.325 M4
	Granite City, Ill.							4.60 G2				
	Kokomo, Ind.											5.325 C9
	Sterling, Ill.	4.55 N4	4.80 N4									5.325 N4
	Niles, Ohio Sharon, Pa.							4.15 S1		5.70 S1	5.95 S1	
	Pittsburgh, Pa. Midland, Pa.	3.95 U1,J3	3.95 U1,J3	4.925 A5,J3, W10,R3,C8	4.675 U1, C11	6.00 C8,C11, W10 6.05 A5	5.925 U1,J3	3.90 U1,J3	4.95 U1	5.25 U1	5.95 U1,J3	5.225 A5,J1 5.475 P6
	Portsmouth, Ohio											5.625 P1
	Weirton, Wheeling, Follansbee, W. Va.	4.10 W3						3.90 W5 4.20 W3				
	Youngstown, Ohio	3.95 U1,Y1, R3	3.95 U1,Y1, R3	4.925 F2,Y1	4.675 U1, C10,Y1	6.00 C10,F2, Y1	5.925 U1 6.425 Y1	3.90 U1,Y1, R3			5.95 R3 6.45 Y1	5.225 Y1
WEST	Fontana, Cal.	4.65 K1	4.65 K1		5.725 K1		7.175 K1	4.55 K1		6.30 K1	6.65 K1	
	Geneva, Utah							3.90 C7			5.95 C7	
	Kansas City, Mo.	4.55 S2	4.55 S2		5.275 S2							5.825 S1
	Los Angeles, Torrance, Cal.	4.65 C7,B2	4.65 C7,B2	6.375 R3	5.725 B2		6.625 B2					6.175 B1
	Minnequa, Colo.	4.40 C6	4.75 C6					4.70 C6				5.475 C6
	San Francisco, Niles, Pittsburg, Cal.	4.65 C7,P9 4.70 B2	4.65 C7,P9 4.70 B2				6.675 B2					6.175 C6,C7
	Seattle, Wash.	4.70 B2,S11	4.70 B2,S11		5.725 S11		6.675 B2	4.80 B2			6.85 B2	
SOUTH	Atlanta, Ga.	4.25 A8	4.25 A8									5.475 A8
	Fairfield, Ala. Alabama City, Ala.	3.95 T2,R3	3.95 T2,R3				5.925 T2	3.90 T2,R3			5.95 T2	5.225 T2, R3
	Houston, Texas Ft. Worth, Texas	4.35 S2	4.35 S2 5.05 T7		5.075 S2			4.30 S2				5.625 S2



# Steel Prices

(Effective June 16, 1953)

## Key to Steel Producers

With Principal Offices

- A1 Acme Steel Co., Chicago  
A2 Alan Wood Steel Co., Conshohocken, Pa.  
A3 Allegheny Ludlum Steel Corp., Pittsburgh  
A4 American Cladmetals Co., Carnegie, Pa.  
A5 American Steel & Wire Div., Cleveland  
A6 Angell Nail & Chaplet Co., Cleveland  
A7 Arco Steel Corp., Middletown, O.  
A8 Atlantic Steel Co., Atlanta, Ga.  
B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.  
B2 Bethlehem Pacific Coast Steel Corp., San Francisco  
B3 Bethlehem Steel Co., Bethlehem, Pa.  
B4 Blair Strip Steel Co., New Castle, Pa.  
B5 Blas & Laughlin, Inc., Harvey, Ill.  
C1 Calstrip Steel Corp., Los Angeles  
C2 Carpenter Steel Co., Reading, Pa.  
C3 Central Iron & Steel Co., Harrisburg, Pa.  
C4 Claymont Products Dept., Claymont, Del.  
C5 Cold Metal Products Co., Youngstown  
C6 Colorado Fuel & Iron Corp., Denver  
C7 Columbia-Geneva Steel Div., San Francisco  
C8 Columbia Steel & Shifting Co., Pittsburgh  
C9 Continental Steel Corp., Kokomo, Ind.  
C10 Copperweld Steel Co., Glassport, Pa.  
C11 Crucible Steel Co. of America, New York  
C12 Cumberland Steel Co., Cumberland, Md.  
C13 Cuyahoga Steel & Wire Co., Cleveland  
D1 Detroit Steel Corp., Detroit  
D2 Detroit Tube & Steel Div., Detroit  
D3 Driver Harris Co., Harrison, N. J.  
D4 Dickson Weatherproof Nail Co., Evanston, Ill.  
E1 Eastern Stainless Steel Co., Baltimore  
E2 Empire Steel Co., Mansfield, O.  
F1 Firth Sterling, Inc., McKeesport, Pa.  
F2 Fitzsimons Steel Corp., Youngstown  
F3 Follansbee Steel Corp., Follansbee, W. Va.  
G1 Globe Iron Co., Jackson, O.  
G2 Granite City Steel Co., Granite City, Ill.  
G3 Great Lakes Steel Corp., Detroit  
H1 Hanna Furnace Corp., Detroit  
I1 Ingersoll Steel Div., Chicago  
I2 Inland Steel Co., Chicago  
I4 Interlake Iron Corp., Cleveland  
J1 Jackson Iron & Steel Co., Jackson, O.  
J2 Joseph Steel Corp., Washington, Pa.  
J3 Jones & Laughlin Steel Corp., Pittsburgh  
J4 Joslyn Mfg. & Supply Co., Chicago  
K1 Kaiser Steel Corp., Fontana, Cal.  
K2 Keystone Steel & Wire Co., Peoria  
K3 Koppers Co., Granite City, Ill.  
L1 Laclede Steel Co., St. Louis  
L2 La Salle Steel Co., Chicago  
L3 Lone Star Steel Co., Dallas  
L4 Lukens Steel Co., Coatesville, Pa.  
M1 Mahoning Valley Steel Co., Niles, O.  
M2 McLouth Steel Corp., Detroit  
M3 Mercer Tube & Mfg. Co., Sharon, Pa.  
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.  
M5 Monarch Steel Co., Inc., Hammond, Ind.  
M6 Mystic Iron Works, Everett, Mass.  
N1 National Supply Co., Pittsburgh  
N2 National Tube Co., Pittsburgh  
N3 Niles Rolling Mills Co., Niles, O.  
N4 Northwestern Steel & Wire Co., Sterling, Ill.  
N5 Newport Steel Corp., Newport, Ky.  
O1 Oliver Iron & Steel Co., Pittsburgh  
P1 Page Steel & Wire Div., Monessen, Pa.  
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.  
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.  
P4 Pittsburgh Coke & Chemical Co., Pittsburgh  
P5 Pittsburgh Screw & Bolt Co., Pittsburgh

- P6 Pittsburgh Steel Co., Pittsburgh  
P7 Portsmouth Div., Detroit Steel Corp., Detroit  
P8 Plymouth Steel Co., Detroit  
P9 Pacific States Steel Co., Niles, Cal.  
P10 Precision Drawn Steel Co., Camden, N. J.  
R1 Reeves Steel & Mfg. Co., Dover, O.  
R2 Reliance Div. Eaton Mfg. Co., Massillon, O.  
R3 Republic Steel Corp., Cleveland  
R4 Roebling Sons Co. (John A.), Trenton, N. J.  
R5 Rotary Electric Steel Co., Detroit  
S1 Sharon Steel Corp., Sharon, Pa.  
S2 Sheffield Steel Corp., Kansas City  
S3 Shenango Furnace Co., Pittsburgh  
S4 Simonds Saw & Steel Co., Fitchburg, Mass.  
S5 Sloss Sheffield Steel & Iron Co., Birmingham  
S6 Standard Forging Corp., Chicago  
S7 Stanley Works, New Britain, Conn.  
S8 Superior Drawn Steel Co., Monaca, Pa.  
S9 Superior Steel Corp., Carnegie, Pa.  
S10 Sweet's Steel Co., Williamsport, Pa.  
S11 Seidelhuber Steel Rolling Mills, Seattle  
T1 Tonawanda Iron Div., N. Tonawanda, N. Y.  
T2 Tennessee Coal & Iron Div., Fairfield  
T3 Tennessee Products & Chem. Corp., Nashville  
T4 Thomas Strip Div., Warren, O.  
T5 Timken Steel & Tube Div., Canton, O.  
T6 Tremont Nail Co., Wareham, Mass.  
T7 Texas Steel Co., Fort Worth  
U1 United States Steel Co., Pittsburgh  
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.  
W1 Wallingford Steel Co., Wallingford, Conn.  
W2 Washington Steel Corp., Washington, Pa.  
W3 Weirton Steel Co., Weirton, W. Va.  
W4 Wheatland Tube Co., Wheatland, Pa.  
W5 Wheeling Steel Corp., Wheeling, W. Va.  
W6 Wickwire Spencer Steel Div., Buffalo  
W7 Wilson Steel & Wire Co., Chicago  
W8 Wisconsin Steel Co., S. Chicago, Ill.  
W9 Woodward Iron Co., Woodward, Ala.  
W10 Wycoff Steel Co., Pittsburgh  
Y1 Youngstown Sheet & Tube Co., Youngstown

## MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails		Woven Wire Fence 9-15 1/2 ga.		Fence Posts		Single Loop Bale Ties		Twisted Barbed Wire		Galv. Barbed Wire		Merch. Wire Ann'd		Merch. Wire Galv.	
	Col	Cal	Col	Cal	Col	Cal	Col	Cal	Col	Cal	Col	Cal	Col	Cal	Col	Cal
Alabama City R31	127	135		132			144	6.075	6.325							
Aliquippa, Pa. J3	126	136					145	6.375	6.90							
Atlanta A8	130	140		125			149	6.325	6.75							
Bartonville K2	127	139	140	132	148		148	6.075	6.50							
Buffalo W6																
Chicago N4	127	136		143	151	151	6.375	6.925								
Cleveland A6																
Cleveland A5							6.375									
Crawfordsville M4	127	138		132			147	6.175	6.475							
Donora, Pa. A5	127	133		143	148	148	6.375	6.775								
Duluth A5	127	133		143	148	148	6.375	6.775								
Fairfield, Ala. T2	127	133		143	148	148	6.375	6.775								
Galveston D4	135															
Houston S2	135	147					156	6.475	6.925							
Johnston, Pa. B3	127		148		149			6.575								
Joliet, Ill. A5	127	133		143	148	148	6.375	6.775								
Kokomo, Ind. C9			142				6.175	6.425								
Los Angeles B2							7.025									
Kansas City S2	139		144				160	6.075	7.125							
Minnequa C6	132	146	138	137			153	6.325	6.70							
Moline, Ill. R3			136													
Pittsburg, Cal. C7	146	156		167	168	168	7.325	7.725								
Monessen P6	127	138		147	147	147	6.075	6.45								
Portsmouth P7	132						6.47									
Rankin, Pa. A5	127	133		148	148	148	6.375	6.775								
So. Chicago R31	127	135	140	132			144	6.075	6.325							
S. San Fran. C6			153				167	7.025	7.40							
Sparrows Pt. B3	129		134	151				6.675								
Struthers, O. Y1							6.225	6.275								
Worcester A5	133						6.675	7.975								
Williamsport, Pa. S10																

Cut Nails, carloads base \$7.80 per 100 lb. (less 20¢ to jobbers) at Conshohocken, Pa. (A2), Wheeling, W. Va. (W5) \$7.80.  
Zinc extra not included on Galv. Merch. Wire.  
Struthers Galv. Merch. Wire based on 15¢ Zinc.

## STAINLESS STEELS

Base price, cents per lb., f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	15.50	16.50	18.00	17.50	26.75	21.75	23.50	13.50	16.25	13.75
Slabs, billets, rerolling	19.75	21.75	23.75	22.75	34.75	28.25	30.75	17.50	21.50	17.75
Forg. discs, die blocks, rings	36.75	37.00	39.75	38.50	57.25	43.50	48.25	30.00	30.50	30.50
Billets, forging	28.25	28.50	30.75	29.75	44.75	33.75	37.75	23.00	23.50	23.50
Bars, wires, structurals	33.75	34.00	36.50	35.50	53.00	40.00	44.75	27.50	28.00	28.00
Plates	35.75	35.75	38.00	38.00	56.00-56.25	44.00	49.00	28.75	29.75	29.25
Sheets	44.25	44.50	46.50	46.50	61.50	53.00	58.00	39.00	39.50	41.50
Strip, hot-rolled	28.50	30.50	35.00	32.75	52.50	40.00	44.50	25.00	32.75	25.75
Strip, cold-rolled	36.50	39.75	43.50	41.75	63.50	52.00	56.50	32.75	39.50	33.25

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2; (type 316 add 4.5¢) J2; Baltimore, El; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Ft. Wayne, J4; Lockport, N. Y., R4.

Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2 (type 316 add 4.5¢); W. Leeburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C5; Lockport, N. Y., S4; Sharon, Pa., S1 (type 301 add 1/4¢); Butler, Pa., A7; Wallingford, Conn., W1.

Bars: Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Lockport, N. Y., S4; Canton, O., T5; Ft. Wayne, J4.

Wires: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11.

Plates: Brackenridge, Pa., A3; Butler, Pa., A7; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Lockport, N. Y., S4; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3.

Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, C11; Ferndale, Mich., A3; Washington, Pa., J2.

Forging billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11.

WASHINGTON STEEL—Slightly lower on 300 series except where noted.



# Miscellaneous Prices

(Effective June 16, 1953)

## PIPE AND TUBING

Base discounts f.o.b. mills. Base price about \$200 per net ton.

	BUTTWELD														SEAMLESS									
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2 In.		3 In.		3 1/2-4 In.			
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.		
STANDARD T. & C.																								
Sparrows Pt. B3	26.25	10.5	29.25	14.5	32.25	18.0	34.25	18.5	35.25	19.5	35.75	20.0	37.25	20.5										
Youngstown R3	28.75	12.5	31.75	16.5	34.25	20.0	36.75	21.0	37.25	22.0	37.75	22.5	39.25	22.5										
Fontana K1	15.75	+0.5	18.75	3.5	21.25	7.0	23.75	8.0	24.25	9.0	24.75	9.5	26.25	9.5										
Pittsburgh J3	28.75	12.5	31.75	16.5	34.25	20.0	36.75	21.0	37.25	22.0	37.75	22.5	39.25	22.5	18.25	2.5	22.25	5.0	24.75	7.50	26.25	9.0		
Alton, Ill. L1	25.75	9.5	28.75	13.5	31.25	17.0	33.75	18.0	34.25	19.0	34.75	19.5	36.25	19.5										
Sharon M3	28.75	12.5	31.75	16.5	34.25	20.0	36.75	21.0	37.25	22.0	37.75	22.5	39.25	22.5										
Pittsburgh N1	28.75	12.5	31.75	16.5	34.25	20.0	36.75	21.0	37.25	22.0	37.75	22.5	39.25	22.5	18.25		22.25		24.75		26.25			
Wheeling W5	28.75	12.5	31.75	16.5	34.25	20.0	36.75	21.0	37.25	22.0	37.75	22.5	39.25	22.5										
Wheatland W4	28.75	12.5	31.75	16.5	34.25	20.0	36.75	21.0	37.25	22.0	37.75	22.5	39.25	22.5										
Youngstown Y1	28.75	12.5	31.75	16.5	34.25	20.0	36.75	21.0	37.25	22.0	37.75	22.5	39.25	22.5	18.25	2.5	22.25	5.0	24.75	7.50	26.25	9.0		
Indiana Harbor Y1	27.75	11.5	30.75	15.5	33.25	19.0	35.75	20.0	36.25	21.0	36.75	21.5	38.25	21.5										
Lorain Y2	28.75	12.5	31.75	16.5	34.25	20.0	36.75	21.0	37.25	22.0	37.75	22.5	39.25	22.5	18.25	2.5	22.25	5.0	24.75	7.50	26.25	9.0		
E&R STRONG PLAIN ENDS																								
Sparrows Pt. B3	30.25	15.5	34.25	19.5	36.25	23.0	36.75	22.0	37.25	23.0	37.75	23.5	38.25	22.5										
Youngstown R3	32.25	17.5	36.25	21.5	38.25	25.0	38.75	24.0	39.25	25.0	39.75	25.5	40.25	24.5										
Fontana K1	19.25		23.25		25.25		25.75		26.25		26.75		27.25											
Pittsburgh J3	32.25	17.5	36.25	21.5	38.25	25.0	38.75	24.0	39.25	25.0	39.75	25.5	40.25	24.5	18.75	3.25	23.25	6.25	26.25	9.25	31.25	12.25		
Alton, Ill. L1	29.25	14.5	33.25	18.5	35.25	22.0	35.75	21.0	36.25	22.0	36.75	22.5	37.25	21.5										
Sharon M3	32.25	17.5	36.25	21.5	38.25	25.0	38.75	24.0	39.25	25.0	39.75	25.5	40.25	24.5										
Pittsburgh N1	32.25	17.5	36.25	21.5	38.25	25.0	38.75	24.0	39.25	25.0	39.75	25.5	40.25	24.5	18.75		23.25		26.25		31.25			
Wheeling W5	32.25	17.5	36.25	21.5	38.25	25.0	38.75	24.0	39.25	25.0	39.75	25.5	40.25	24.5										
Wheatland W4	32.25	17.5	36.25	21.5	38.25	25.0	38.75	24.0	39.25	25.0	39.75	25.5	40.25	24.5										
Youngstown Y1	32.25	17.5	36.25	21.5	38.25	25.0	38.75	24.0	39.25	25.0	39.75	25.5	40.25	24.5	18.75	3.25	23.25	6.25	26.25	9.25	31.25	12.25		
Indiana Harbor Y1	31.25	16.5	35.25	20.5	37.25	24.0	37.75	23.0	38.25	24.0	38.75	24.5	39.25	23.5										
Lorain N2	32.25	17.5	36.25	21.5	38.25	25.0	38.75	24.0	39.25	25.0	39.75	25.5	40.25	24.5	18.75	3.25	23.25	6.25	26.25	9.25	31.25	12.25		

Galvanized discounts based on zinc, at 11¢ per lb., East St. Louis. For each 1¢ change in zinc, discounts vary as follows: 1/2 in., 3/4 in., and 1 in., 1 pt.; 1 1/4 in., 1 1/2 in., 2 in., 3/4 pt.; 2 1/2 in., 3 in., 1/4 pt. Calculate discounts on even cents per lb. of zinc, i. e., if zinc is 16.51¢ to 17.50¢ per lb., use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only butt-weld and seamless, 2 1/4 pt. higher discount. Plain ends, butt-weld and seamless, 3 in. and under, 4 1/2 pts. higher discount. Butt-weld jobber's discount, 5 pt. East St. Louis zinc price now 11.0¢.

## COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	\$14.50 to \$15.00
Foundry beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.50 to \$18.00
Foundry, oven coke	
Buffalo, del'd	\$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	28.75
St. Louis, f.o.b.	26.00
Birmingham, del'd	23.21
Lone Star, Tex., f.o.b.	18.50

## ELECTRICAL SHEETS

22 Ga. H-R cut length	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
F.o.b. Mill Cents Per Lb.							
Beach Bottom W5	7.85	9.10	9.90	10.45	11.00	11.70	
Brackenridge A3	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Granite City G2	8.55	9.60					
Ind. Harbor J3	7.35	7.85	9.10	9.90			
Manassas E2	7.35	7.85	9.10	9.90			
Newport, Ky. N5	7.35	7.85	9.10	9.90	10.45		
Niles, O. N3	7.35	7.85					
Vandergrift U1	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Warren, O. R3	7.35	7.85	9.10				
Zanesville A7	7.35	7.85	9.10	9.90	10.45	11.00	11.70

## CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	\$110.80 to \$113.80
6 to 24-in., del'd N.Y.	113.50 to 114.80
6 to 24-in. Birmingham	96.50 to 101.00
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	\$128.00 to \$130.00
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

## BOILER TUBES

\$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	27.71	33.81		
	2 1/2	12	37.31	45.52		
	3	12	30.66	37.41		
	3 1/2	11	50.29	61.35		
	4	10	66.78	81.47		
National Tube	2	13	31.29	22.73		
	2 1/2	12	34.54	42.14	31.19	
	3	12	39.89	48.65	35.76	
	3 1/2	11	46.56	56.80	42.42	
	4	10	61.83	75.42	53.85	
Pittsburgh Steel	2	13				
	2 1/2	12				
	3	12				
	3 1/2	11				
	4	10				

## C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill		CARBON CONTENT				
		0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bridgeport, Conn. S7	5.80	7.65	8.25	10.20	12.50	
Carnegie, Pa. S9		7.65	8.25	10.20	12.50	
Cleveland A5	5.10	7.30	8.25	10.20	12.50	
Detroit D1	6.45	7.50	8.10			
New Castle, Pa. B4	5.80	7.65	8.25			
New Haven, Conn. D1	6.70	7.60	8.20			
Sharon, Pa. S1	5.80	7.65	8.25	10.20	12.50	
Trenton, N. J. R4		7.95	8.55	10.50	12.80	
Warren, Ohio T4	6.20	7.65	8.25	10.20	12.50	
Weirton, W. Va. W3	5.80	7.65	8.25	10.20	12.50	
Worcester, Mass. A5	5.40	7.60	8.55	10.50	12.80	
Youngstown C5		7.65	8.25	10.20	12.50	

\* Sold on Pittsburgh Base.

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery
Bethlehem B3	56.50	57.00	57.50	58.00		
Birmingham R3	50.88	51.38				
Birmingham W9	50.88	51.38				
Birmingham S5	50.88	51.38				
Buffalo R3	54.50	55.00	55.50			
Buffalo H1	54.50	55.00	55.50			
Buffalo W6	54.50	55.00	55.50			66.75
Chicago I4	54.50	55.00	55.00	55.50		
Cleveland A5	54.50	55.00	55.00	55.50	59.50	
Cleveland R3	54.50	55.00	55.00			
Douglasfield, Tex. L3	50.50	51.00	51.00			
Duluth I4	54.50	55.00	55.00	55.50		
Erie I4	54.50	55.00	55.00	55.50		
Everett, Mass. M6		50.50	60.00			
Fontana K1	60.50	61.00				
Geneva, Utah C7	54.50	55.00				
Granite City, Ill. K3	56.40	56.90	57.40			
Hubbard, Ohio Y1	54.50	55.00	55.00			
Jackson, Ohio J1 G1						65.50
Minnequa C6	56.50	57.50	57.50			
Monessen P6	56.50					
Neville Island P4	54.50	55.00	55.00	55.50		
Pittsburgh U1	54.50			55.50		
Sharpville S3	54.50	55.00	55.00	55.50		
Steelton B3	56.50	57.00	57.50	58.00	62.50	
Swedeland A2	58.50	59.00	59.50	60.00		
Toledo I4	54.50	55.00	55.00	55.50		
Troy, N. Y. R3	56.50	57.00	57.50	58.00	62.50	
Youngstown Y1	54.50	55.00	55.00	55.50		
N. Tonawanda, N. Y. T1		55.00	55.50			

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct). 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 and over. Silvery iron: Add \$1.50 per ton net for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. \$1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferroalloy prices are \$1 over comparable silvery iron.



# Miscellaneous Prices

(Effective June 18, 1953)

## RAILS, TRACK SUPPLIES

Fab. Mill Cents Per Lb.	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Dessmet U/I	4.075	5.00	5.075	6.65			
Chicago R3							
Cleveland R3	4.075	5.00		6.65	4.925		
Endley T2		5.00			4.925		
Fairfield T2	4.075	5.00			4.925		
Gary U/I	4.075	5.075	6.90		4.925		
Ind. Harbor I3		4.55					
Johnstown B3		5.00	5.075				
Juliet U/I							
Kansas City S2	4.075	4.55	5.075		4.925		
Lackawanna B3				6.65			
Lebanon B7	4.075	5.05	5.075	6.90	4.925	10.00	
Minnequa C6							
Pittsburgh R3							
Pittsburgh O1							
Pittsburgh P5				6.65			
Pittsburgh J3							
Pittg. Cal. C7				7.30	5.075		
Seattle B7				5.075	4.925		
Steelton B3	4.075		5.075				
Struthers Y1				6.65			
Terrace C7					5.075		
Youngstown R3				6.65			

## TOOL STEEL

F.o.b. mill

Add 4.7 pct to base and extras.

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	\$1.505
18	4	1	—	5	\$2.13
18	4	2	—	—	\$1.65
1.5	4	1.5	8	—	\$1.06
6	4	2	6	—	\$6.56
High-carbon chromium					
Oil hardened manganese					
Special carbon					
Extra carbon					
Regular carbon					
Warehouse prices on and east of Miss-					
issippi are 3.5¢ per lb. higher. West of					
Mississippi, 5.5¢ higher.					

## CLAD STEEL

Add 4.7 pct to base and extras.

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. L4	\$29.5	
Washington, Pa. J2	\$29.5	
Claymont, Del. C4	\$29.50	
Conshohocken, Pa. A2	\$27.50	\$26.24
New Castle, Ind. I2	\$29.77	
Nickel-carbon		
10 pct. Coatesville, Pa. L4	32.5	
Inconel-carbon		
10 pct. Coatesville, Pa. L4	40.5	
Monel-carbon		
10 pct. Coatesville, Pa. L4	33.5	
No. 302 Stainless copper stainless, Carnegie, Pa. A4		77.00
Aluminized steel sheets, hot dip, Butler, Pa., 47		7.75
* Includes annealing and pickling, sandblasting.		

## ELECTRODES

Cents per lb, f.o.b. plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
GRAPHITE		
24	84	18.70
17, 18, 20	60, 72	18.70
8 to 16	48, 60, 72	18.70
7	48, 60	20.50
6	48, 60	21.95
4, 5	40	22.53
3	40	23.68
2.5	24, 30	24.26
2	24, 30	26.57
CARBON		
40	100, 110	8.95
35	110	8.95
30	110	8.95
24	72 to 84	9.10
20	90	8.95
17	62	9.10
14	72	9.50
10, 12	60	10.30
8	60	10.55

## FLUORSPAR

Washed gravel, f.o.b. Rosclaire, Ill.  
Price, net ton; Effective CaF<sub>2</sub> content:  
72% or more \$44.00  
70% or more 42.50  
60% or less 38.00

## BOLTS, NUTS, RIVETS, SCREWS

### Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

### Nuts, Hot Pressed, Cold Punched—Sq.

	Pct Off List	Less Keg	K.	Less Keg	K.
		Reg.		Hvy.	
1/2 in. & smaller	10	24	10	24	
9/16 in. & 5/8 in.	8	21	1	16	
3/4 in. to 1 1/2 in.					
inclusive	4	18	+4	12	
1 3/4 in. & larger	2	17	+4	12	

### Nuts, Hot Pressed—Hexagon

1/2 in. & smaller	22	33	18	30
9/16 in. & 5/8 in.	12	25	1	16
3/4 in. to 1 1/2 in.				
inclusive	8	21	+3	13
1 3/4 in. & larger	4	18	+3	13

### Nuts, Cold Punched—Hexagon

1/2 in. & smaller	22	33	18	30
9/16 in. & 5/8 in.	19	31	13	26
3/4 in. to 1 1/2 in.				
inclusive	15	27	8	21
1 3/4 in. & larger	2	17	+4	12

### Nuts, Semi-Finished—Hexagon

	Reg.	Hvy.
1/2 in. & smaller	33	43
9/16 in. & 5/8 in.	27	38
3/4 in. to 1 1/2 in.		
inclusive	21	23
1 3/4 in. & larger	5	19
		net
7/16 in. & small-		
er	33	43
1/2 in. thru 5/8 in.	26	37
3/4 in. to 1 1/2 in.		
inclusive	18	30

### Stove Bolts

	Pct Off List
Packaged, steel, plain finished	44 1/2—10
Packaged, plain finish	25 1/2—10
Bulk, plain finish**	59*

\*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

\*\*Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

### Rivets

	Base per 100 lb
1/2 in. & larger	\$8.50
	Pct Off List
7/16 in. and smaller	30

### Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 5/8 in. x 6 in., SAE 1020, bright	40
3/4 in. thru 1 in. up to & including 6 in.	26
1/4 in. thru 5/8 in. x 6 in. & shorter	
high C double heat treat	43
3/4 in. thru 1 in. up to & including 6 in.	33
Milled studs	17
Flat head cap screws, listed sizes	12
Fillister head cap, listed sizes	7
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	37

### Machine and Carriage Bolts

	Pct Off List
	Less Case C.
1/2 in. & smaller x 6 in. & shorter	11
9/16 in. & 5/8 in. x 6 in. & shorter	15
3/4 in. & larger x 6 in. & shorter	14
All diam. longer than 6 in.	8
Lag, all diam. x 6 in. & shorter	19
Lag, all diam. longer than 6 in.	16
Plow bolts	30

## REFRACTORIES

### Fire Clay Brick

Carloads, per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.25) \$99.30  
No. 1 Ohio 92.40  
Sec. quality, Pa., Md., Ky., Mo., Ill. 92.40  
No. 2 Ohio 83.15  
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.60) 14.40

### Silica Brick

Mt. Union, Pa., Ensley, Ala. \$99.30  
Childs, Pa. 103.95  
Hays, Pa. 105.10  
Chicago District 122.40  
Western Utah 116.55  
California 122.85  
Super Duty, Hays, Pa., Athens, Tex., Chicago 116.65  
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 17.30  
Silica cement, net ton, bulk, Hays, Pa. 19.60  
Silica cement, net ton, bulk, Ensley, Ala. 18.45  
Silica cement, net ton, bulk, Chicago District 18.45  
Silica cement, net ton, bulk, Utah and Calif. 25.95

### Chrome Brick

Per net ton

Standard chemically bonded Balt., Chester \$86.00  
Burned, Balt., Chester 80.00

### Magnesite Brick

Standard Baltimore \$109.00  
Chemically bonded, Baltimore 97.50

### Grain Magnesite

St. 3/4-in. grains

Domestic, f.o.b. Baltimore in bulk fines removed \$64.40  
Domestic, f.o.b. Chewalah, Wash., in bulk 38.00  
in sacks 43.70

### Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ \$13.75

## LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices through June 30, 1953, delivery.

	Gross Ton
Openhearth lump	\$10.95
Old range, bessemer	10.10
Old range, nonbessemer	9.95
Mesabi, bessemer	9.85
Mesabi, nonbessemer	9.70
High phosphorus	9.70

Prices based on upper Lake rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on Dec. 31, 1952. Increases or decreases after such date are for buyer's account.

## METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron, c.i.f. New York, ocean bags 10.9¢  
Canadian sponge iron, del's. in East 12.0¢  
Domestic sponge iron, 98+ % Fe, carloads lots 15.5¢ to 17.0¢  
Electrolytic iron, annealed, 99.5+ % Fe 44.0¢  
Electrolytic iron, unannealed, minus 325 mesh, 99+ % Fe 60.0¢  
Hydrogen reduced iron, minus 300 mesh, 98+ % Fe 53.0¢ to 80.0¢  
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+ % Fe 83.0¢ to \$1.48  
Aluminum 31.5¢  
Brass, 10 ton lots 30.00¢ to 33.25¢  
Copper, electrolytic 43.50¢  
Copper, reduced 43.50¢  
Cadmium, 100-199 lb., 95¢ plus metal value  
Chromium, electrolytic, 99% min., and quantity, del'd. \$3.50  
Lead 21.75¢  
Manganese 57.0¢  
Molybdenum, 99% 27.75¢  
Nickel, unannealed 88.0¢  
Nickel, annealed 95.0¢  
Nickel, spherical, unannealed 92.0¢  
Silicon 33.5¢  
Solder powder, 7.0¢ to 9.0¢ plus met. value  
Stainless steel, 302 83.9¢  
Stainless steel, 316 \$1.10  
Tin 14.04¢ plus metal value  
Tungsten, 99% (65 mesh) \$5.50  
Zinc, 10 ton lots 23.0¢ to 30.5¢



# Ferroalloy Prices

(Effective June 16, 1953)

## Ferrochrome

Contract prices, cents per pound, contained CR, lump size, bulk in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C	34.50	0.20% C	33.50
0.10% C	34.00	0.50% C	33.25
0.15% C	33.75	1.00% C	33.00
2.00% C			32.75
65-69% Cr, 4-9% C			24.75
62-66% Cr, 4-6% C, 6-9% Si			25.60

## S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

## High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

## Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	\$1.18
0.50% max. C	1.14
9 to 11% C	1.11

## Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.)

Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 25.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 25.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

## Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Cr, 60-65% Si, 3.00% max. Fe	19.00
Ton lots	22.10
Less ton lots	23.60

## Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si	20.00
Ton lots	22.30
Less ton lots	23.30

## CM5Z

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

## SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 26% Fe ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

## V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 33-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

## Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.50
Ton lots to carload packed	18.50
Less ton lots	20.00

## Ferromanganese

Maximum contract base price, f.o.b., lump size:

Producing Point	Base Mn Content	Cents per lb (Contained Mn)
-----------------	-----------------	-----------------------------

Niagara Falls, Alloy, Ashtabula	76-80%	13.15
(Per lb of alloy)		
Etna, Clairton, Pa.	74-76%	10.00
Johnstown, Pa.	74-76%	10.00
Sheridan, Pa.	74-76%	10.00

Add or subtract 0.1¢ for each 1% Mn above or below base content.

Briquets—delivered, 66 pct. Mn.

Carload, bulk	12.50
Ton lots, packed	14.05

## Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	Price
16 to 19%	3% max.	\$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

## Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	36.95
Ton lots	33.45

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	30.00
Ton lots	32.00
Less ton lots	34.00 to 37.00
Premium for hydrogen-removed metal	1.50

## Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	28.45	30.30
0.07% max. C	27.95	29.80
0.15% max. C	27.45	29.30
0.30% max. C	26.95	28.80
0.50% max. C	26.45	28.30
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30
	26.50	

## Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn

	21.35¢
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## Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk	11.40
Ton lots	13.05
Briquet contract basis carlots, bulk delivered, per lb of briquet	12.65
Ton lots, packed	14.25

## Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$95.50 gross ton, freight allowed to normal trade area.

Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00. Add \$1.055 per ton for each additional 0.50% Si up to and including 17%. Add \$1.00 for each 0.50% Mn over 1%.

## Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

26% Si, 2% Fe	18.00
37% Si, 1% Fe	18.50

## Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.55

## Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90.95% Si			17.00

## Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	\$2.05	\$2.95	\$3.75
Less ton lots	2.40	3.30	4.55

## Ferrovandium

35-55% contract basis, delivered, per pound, contained V.

Openhearth	\$3.00-\$3.10
Crucible	3.10-3.20
High speed steel (Primus)	3.20-3.25

Aisifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carloads	9.90
Ton lots	11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo

	\$1.15
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Ferrocolumbium, 50-60% 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	\$4.90
Less ton lots	4.95

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30% C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta

	\$3.75
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Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo

	\$1.22
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Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton

	\$65.00
10 tons to less carload	\$75.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

	\$1.35
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Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

	\$1.50
Less ton lots	1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton

	\$177.00
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Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, f.o.b.

	\$4.45
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Molybdenic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.

	\$1.14
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bags, f.o.b. Washington, Pa., Langeloth, Pa.

	\$1.12
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Simnani, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢

Vanadium Pentoxide, 86-89% V<sub>2</sub>O<sub>5</sub> contract basis, per pound contained V<sub>2</sub>O<sub>5</sub>

	\$1.23
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Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Ton lots	21.00¢
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Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.

Carload, bulk	7.00¢
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## Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4% Si, 40-45%, per lb contained B

	\$5.25
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Bortam, f.o.b. Niagara Falls

Ton lots, per pound	46¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots, per pound	10.00¢
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Ferroboration, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots

	\$2.20
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F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	35
14 to 10% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.

No. 1	\$1.00
No. 6	65¢
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd

Ton lots	\$1.46
Less ton lots	1.57

Nickel-Boron, 15-18%, B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered

Less ton lots	\$1.20
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Silenz, contract basis, delivered.

Ton lots	45.00¢
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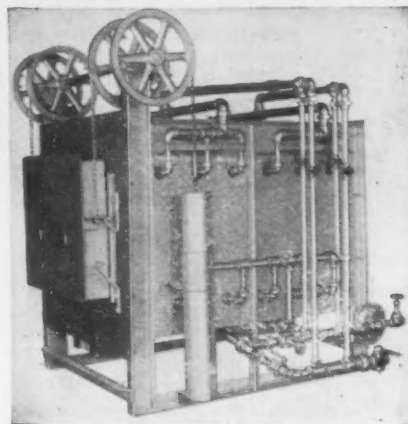
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**METAL CARBIDES CORPORATION**  
YOUNGSTOWN 7, OHIO



**RE-NU-BILT  
GUARANTEED  
ELECTRIC POWER  
EQUIPMENT  
D. C. MOTORS**

Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCF	600	400/500
1	2000	Whase.	Mill	600	230/460
1	940	Whase.	QM	250	140/170
1	900	Whase.		250	450/550
1	800	Al. Ch.		250	400/800
1	500	Whase.	CC-216	600	300/900
2	450	Whase.		550	415
1	400	G.E.	MCF	550	300/1050
2	300	Whase.	CB-5094	230	575/1150
1	200/300	G.E.	MPC	230	360/820
1	200	Rel.	1970T	230	720
1	200	Whase.	CB-5113	230	400/900
1	150	Whase.	CB-2073	230	575/1150
1	150	G.E.		600	250/750
1	150	Cr. Wh.	65H	230	1150
9	150	Cr. Wh.	53H-TEPC	230	960
1	150	Whase.	SK-151B	230	900/1800
1	150	Whase.	SK-201	230	360/950
1	50/120	G.E.	MCF	230	250/1000
2	100	Whase.	SK-181	230	450/1000
1	100	G.E.	CDP-115	230	1750

**MILL & CRANE**

1	50	G.E.	CO-1810	230	725
1	20	Whase.	K-5	230	875
4	15	Whase.	K-5	230	630
8	10	C.W.	SCM-AH	230	1150
1	10	G.E.	MD-104	230	400/800
3	6.25	Whase.	K-3	230	880
2	3	C.W.	SCM-PF	230	1750
2	3	Whase.	HK-3	230	835

**A.C. MOTORS  
3 phase—60 cycle  
SLIP RING**

Qu.	H.P.	Make	Type	Volts	Speed
1	1800	G.E.	MT-403	2300	360
1	1500	ABH		2300	720
1	1200	G.E.	MF-26	2300	275
2	1000	A.C.	MH	240	240
1	500	Whase.	CW	850	350
1	500	G.E.	IM	440	900
1	500	G.E.	M-574-Y	6600	900
1	400	Whase.	CW	440	514
1	400	Whase.	CW-1218	2200	435
1	350	G.E.	MT-442Y	2200/4000	253
2	300	G.E.	MT-545Y	2300	900
1	300	A.C.	3-Brz	440	505
1	250	G.E.	MT-124-Y	4000	257
1	250	G.E.	MT-5598	2200	1800
1	250	Al. Ch.		550	600
1	200	Cr. Wh.	260H	440	505
1	200	G.E.	IM-17	440	600
1	200	G.E.	IM	440	435
1	200	G.E.	MTP	440	1170
1	150 (unused)	Whase.	CW	2300	435
1	150	G.E.	IM-18	440	600
2	125	A.C.		440	365
1	125	Al. Ch.		440	720
4	125	G.E.	MT-566Y	440/2200	435
1	100	G.E.	IM	440	600
5	100	A.C.	ANY	440	695
1	100	G.E.	IM-18	2200	435
1	100	Whase.	CW-668A	440	700

**SQUIRREL CAGE**

2	850	G.E.	FT-559BY	440	3570
2	450	Whase.	CR-1420	2300/4150	354
1	200	G.E.	IK-17	440	580
1	200	G.E.	IK	440	865
8	200	G.E.	KTP-857	440	1800
1	150	Whase.	CS-8568	440	880
1	150	Whase.	CS	440	580
1	150/75	G.E.	IK	440	900/450
2	125	Al. Ch.	ARW	2200	1750
1	125	G.E.	KF-6328-Z	440/2200	3585
1	125	Whase.	MS	440	485

**SYNCHRONOUS**

2	3500	G.E.	TS	2300	257
2	2100	G.E.	ATT	125	2300
2	1750	G.E.	ATT	2306	8600
2	2000	Whase.		2300	120
5	735	G.E.	ATT	2200/12000	600
1	450	Whase.		2200	450
2	350	G.E.	TS	2200	158

**M-G Sets — 3 Ph. 60 Cy.**

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
1	2000	G.E.	500	660	11000
1	2000	G.E.	514	600	6600/13200
9	1500	G.E.	514	250	6600/13200
1	1500	G.E.	720	600	6600/13200
1	1500	G.E.	360	275	4400
1	1500	G.E.	600	600	4160
1	1500	C.W.	514	115	4000/13000
2	1000	Whase.	900	600	4160
1	1000	G.E.	900	260	6600
1	1000 (SU)	G.E.	900	250	2200
1	750	Whase.	900	275	4160
1	750	C.W.	514	115	2300
1	600	G.E.	720	250	440/2300
1	500	G.E.	720	125	2300
1	500	Whase.	900	125/250	440
1	500	Whase.	900	250	6600/13200
1	500	Whase.	1200	125/250	2300
1	400	Whase.	1200	250	2300
1	400 (SU)	Cr. Wh.	1200	125/250	2300
1	150	Whase.	1200	275	880
1	140 (SU)	Cr. Wh.	890	125/250	440/2300
1	100	Delco	1200	125/250	2300
1	100	G.E.	1170	125	220/440

**FREQUENCY CHANGER SETS**

Qu.	K.W.	Make	Freq.	Volts
1	3600	G.E.	25/60	3300/2500/4800
2	3500	G.E.	25/62.5	2300/2300
1	1000	G.E.	25/58.3	4400/2300
1	500	Al. Ch.	2560	11000/2300

**BELYEA COMPANY, INC.**  
47 Howell Street, Jersey City 6, N. J.

# The Clearing House

NEWS OF USED AND REBUILT MACHINERY

Sell at 55 Pct . . . "Let's get back in the used machinery business. For the past several years we have been selling quick delivery instead of machinery. We have got to start quoting the prices at which we intend to sell—not those we would like to get. That means those who survive will be selling a good rebuilt machine for 55 pct of original cost instead of 90 pct."

That's what Frank Laurens, past-president of the Machinery Dealers National Assn., told the 250 members attending the 12th annual MDNA convention in Cleveland last week. Dealers at the meeting seemed to agree wholeheartedly with Mr. Laurens' suggestion.

More Time-Payments . . . Other MDNA members who summarized business conditions in different parts of the country pointed out that tight money, buyer resistance and long term depreciation were difficult obstacles that would have to be overcome on the road to improved sales.

Also commented on by several spokesmen was the increase in time-payments and rental arrangements for used machine tools (THE IRON AGE, June 12, p. 82).

Business Cut in Half . . . Most dealers at the convention agreed that the sales drop from last year, estimated at 50 pct, called for serious attention, and during an informal skull session concrete proposals were offered on ways to improve sales. Suggestions that attracted most attention were:

(1) Make quick sales of "dogs" which cannot be expected to increase in value; (2) reduce prices to realistic levels to meet competition of new foreign machines; (3) concentrate on repetitive sales rather than one-shot deals which can't be classified as normal business; (4) start a doorbell sales campaign based on dealer integrity and better customer service.

Want Fast Writeoff . . . Outgoing MDNA officers assured members that the association will continue to work for long range improvements to help dealers and will keep up its efforts to obtain faster tax writeoffs on machinery.

Officials also told members that they will not have to worry so much about government-leased tools since the pools of good all-purpose tools have dwindled considerably.

Korean Settlement . . . Dealers who were willing to comment about the effect of a Korean peace on the used machinery business said they believe that the variety of civilian demand will be sufficient to keep dealers busy.

The paradox of high auction bids in the face of sliding prices was another topic discussed, though no definite conclusions were reached. Outgoing MDNA President Joseph Weiss of Chicago said this condition existed in his area and mentioned one instance in which a 54 in. Bullard sold for \$9000 more than would normally be expected.

One dealer blamed the high bids on auction psychology: "If you are sent out with orders to get a certain machine and one of the oldtimers bids high, you naturally figure it must be worth it, so you get in the race," he said.

Interests Are Identical . . . Guest speakers Swan Bergstrom and Commander Arthur Johnson both gave encouraging talks. Mr. Bergstrom, president of the National Machine Tool Builders' Assn., told dealers that sellers of both new and used machines will move on to greater prosperity if they remember that their interests are identical.

Commander Johnson, National Production Authority spokesman, told the convention that it was the desire of the Department of Commerce to avoid past government errors which resulted in fantastic emergency demands and war assets selling.